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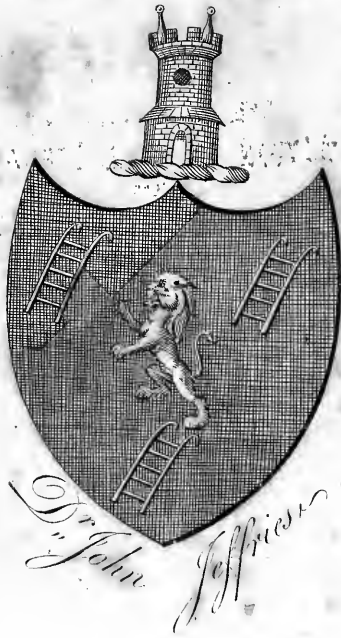
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A  
PRACTICAL SYSTEM  
OF  
SURGERY.

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A  
PRACTICAL SYSTEM  
OF  
SURGERY.

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BY JAMES LATTA,  
SURGEON IN EDINBURGH.

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ILLUSTRATED WITH CASES ON MANY OF THE SUBJECTS,  
AND WITH COPPERPLATES.

*IN THREE VOLUMES.*

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VOLUME II.

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EDINBURGH:

PRINTED FOR G. MUDIE & SON, A. GUTHRIE,  
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# C O N T E N T S.

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## CHAP. I.

<i>Of the</i> SUPPRESSION <i>of</i> URINE,	Page I
--	-----------

## CHAP. II.

<i>Of the</i> INCONTINENCE <i>of</i> URINE,	II
---	----

## CHAP. III.

<i>Of the</i> FISTULÆ <i>in</i> PERINÆO,	15
--	----

CASE I. J. J. a man of 46 years of age,	20
---	----

II. J. M. C. a man of 42 years of age,	23
--	----

III. J. D. 36 years of age,	26
-----------------------------	----

IV. J. S. a man of 32 years of age,	29
-------------------------------------	----

## CHAP. IV.

<i>Of the</i> HÆMORRHOIDS,	32
----------------------------	----

## CHAP. V.

<i>Of the</i> FISTULA <i>in</i> ANO,	39
--------------------------------------	----

CASE I. J. H. a man of 30 years of age,	66
---	----

II. A. M.	70
-----------	----

III. J. M'D. a man of 40 years of age,	72
--	----

IV. K. P. a young man of 22 years,	74
------------------------------------	----

V. J. W. 30 years of age,	75
---------------------------	----

VI. J. M. a man of 36 years of age,	79
-------------------------------------	----

	Page
CHAP. VI.	
<i>Of a PROLAPSUS ANI,</i>	81
CHAP. VII.	
<i>Of an IMPERFORATED ANUS,</i>	84
CHAP. VIII.	
<i>Of the PARACENTESIS of the ABDOMEN,</i>	88
CHAP. IX.	
PARACENTESIS <i>of the THORAX,</i>	95
CHAP. X.	
<i>Of BRONCHOTOMY,</i>	104
CHAP. XI.	
<i>Of OESOPHAGOTOMY,</i>	108
CHAP. XII.	
<i>Of WOUNDS and CONTUSIONS of the HEAD,</i>	111
SECTION I.	
<i>Of Injuries Affecting the External Integu- ments of the Head,</i>	112
SECTION II.	
<i>Of the Affections of the Brain arising from Compression, by Fracture of the Cranium, or Extravasation of Blood, or other Fluid, within its Cavity,</i>	118

SECTION III.

<i>Of Fractures and Fissures of the Skull, and the symptoms attending them, with those arising from Concussions of the Brain,</i>	127
---	-----

SECTION IV.

<i>Of the method of treating of Wounds, and other Affections of the Head from External Violence,</i>	135
--	-----

SECTION V.

<i>Cases of Compressed Brain, in which the Trepan was not applied,</i>	166
CASE I. J. R. a boy of fourteen,	ib.
II. J. S. a boy of seven years of age,	169
III. A. M. a female of six years,	173

SECTION VI.

<i>Of a Concussion of the Brain,</i>	175
--------------------------------------	-----

CHAP. XIII.

<i>Of DISEASES of the EYES,</i>	180
---------------------------------	-----

SECTION I.

<i>Of Ophthalmia, or Inflammation of the Eyes,</i>	184
--	-----

SECTION II.

<i>Of Abscesses in the Eyes,</i>	192
----------------------------------	-----

SECTION III.

<i>Of the Dropsy of the Eye, Warts, Wens, Steatomatous Tumors, &amp;c. on the Eyelids, and Globe of the Eye,</i>	198
--	-----

	Page
SECTION IV.	
<i>Of the Inchiafis, or Inversion of the Cilia,</i>	208
SECTION V.	
<i>Of the Ectropium, Gaping Eye, or turning out of the Eyelids,</i>	214
SECTION. VI.	
<i>Of Concretions of the Eyelids,</i>	217
SECTION VII.	
<i>Of Specks, or Films on the Eye,</i>	219
CASE V. J. S. 26 years of age,	223
VI. A. S. 36 years of age,	226
SECTION VIII.	
<i>Of Ulcers in the Globe of the Eye,</i>	230
SECTION IX.	
<i>Of the Protrusion, or total displacing of the Globe of the Eye from its Socket,</i>	235
SECTION X.	
<i>Of Cancers in the Eye, and Extirpation of the Eyeball,</i>	237
SECTION XI.	
<i>Of the Cataract,</i>	240
SECTION XII.	
<i>Of Extracting the Cataract,</i>	263
SECTION XIII.	
<i>Of the Fistula Lachrymalis,</i>	279



# CONTENTS.

v

Page

## CHAP. XIV.

DISEASES of the NOSE and MOUTH, 301

### SECTION I.

*Hæmorrhages from the Nose,* ib.

### SECTION II.

*Of the Polypus of the Nose,* 305

### SECTION III.

*Of the Enlargement and Extirpation of the Tonsils,* 318

### SECTION IV.

*Of the Extirpation of the Uvula,* 322

### SECTION V.

*Of the Relief which may be afforded in Diseases of the Throat, by External Remedies,* 324

### SECTION VI.

*Of the Ozaena, or Ulcer in the Nose,* 327

### SECTION VII.

*Of Abscesses on the Gums,* 332

### SECTION VIII.

*Of Abscesses in the Antrum Maxillare,* 341

### SECTION IX.

*Of the Swelling of the Cheek Bones, and their Conversion into a Cartilaginous or Gelatinous Substance,* 347

	Page
SECTION X.	
<i>Of Excrescences on the Gums,</i>	348
SECTION XI.	
<i>Of the Ranula,</i>	352
SECTION XII.	
<i>Of Ulcers in the Mouth and Tongue, and Entirpation of part of the Tongue itself,</i>	357
SECTION XIII.	
<i>Division of the Frænum Linguz,</i>	365
SECTION XIV.	
<i>Division of the Parotid Duct,</i>	366
SECTION XV.	
<i>Of the Hæc-Lip,</i>	374
SECTION XVI.	
<i>Entirpation of Cancerous Lips,</i>	382
SECTION XVII.	
<i>Of Dentition,</i>	387
SECTION XVIII.	
<i>Derangement of the Teeth,</i>	393
SECTION XIX.	
<i>Of Loose Teeth,</i>	396
SECTION XX.	
<i>Of the Cleaning of Teeth,</i>	402

# CONTENTS.

vii

Page

## SECTION XXI.

*Of the Toothach,* 407

## SECTION XXII.

*Of the Transplantation of Teeth,* 430

### CHAP XV.

DISEASES *of the* EARS, 434

### CHAP. XVI.

*Of the WRY-NECK,* 446

### CHAP. XVII.

DISEASES *of the* NIPPLES, 450

### CHAP. XVIII.

*Of* ISSUES, 455

### CHAP. XIX.

INOCULATION *for the* SMALL-POX, 459

### CHAP. XX.

*Of a* DISTORTED SPINE, 463

### CHAP XXI.

DISTORTIONS *of the* LIMBS, 467

### CHAP. XXII.

*Of* INDOLENT TUMORS, 469

## SECTION I.

*Of Encysted Tumors,* ib.

§ 1. *Steatoma,* ib.

§ 2. *Meliceris and Atheroma,* 471

§ 3. *Cases of Encysted Tumors,* 476

VOL. II.

	Page
CASE I. Mrs S—, 60 years of age,	476
II. M. J. 30 years of age,	477
III. A. W. aged 43,	479
SECTION II.	
<i>Of Ganglions,</i>	480
SECTION III.	
<i>Of Swellings of the Bursa Mucosa,</i>	481
SECTION IV.	
<i>Of Collections within the Capsular Ligaments,</i>	487
CASE I. J. S. 29 years of age,	490
SECTION V.	
<i>Of Cartilaginous Bodies within the Cavity of the Joint,</i>	403
SECTION VII.	
<i>Of Anasarca, or Oedema,</i>	497
SECTION VIII.	
<i>Of the Nævi Materni,</i>	499
SECTION IX.	
<i>Of Warts,</i>	503
SECTION X.	
<i>Of Cancerous Breasts,</i>	509
SECTION XI.	
<i>Of Fleshy Excrescences,</i>	516
SECTION XII.	
<i>Of Simple Exostosis, and of Venereal Exco- stoses, or Nodes,</i>	517

# CONTENTS.

xi

Page.

## SECTION XIII.

*Of Corns,*

527

## SECTION XIV.

*Of the Hydrocephalus Internus, and Spina  
Bifida,*

530

## SECTION XV.

*Of the Bronchocele,*

531

## SECTION XVI.

*Of Scrophulous Tumors,*

531

## CHAP. XXIII.

*Of DIMINISHING the PAIN in CHIRURGI-  
CAL OPERATIONS,*

533

*To the Binder.*

Place PLATE 1st opposite Page 32

2d 112

3d 184

4th 302

5th 302

6th 302

7th 470

8th 470

9th 470

SECTION 1

SECTION 2

SECTION 3

SECTION 4

SECTION 5

SECTION 6

SECTION 7

SECTION 8

SECTION 9

SECTION 10

SECTION 11

SECTION 12

SECTION 13

SECTION 14

SECTION 15

SECTION 16

SECTION 17

SECTION 18



# PRACTICAL SYSTEM

OF

## SURGERY.

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### CHAPTER I.

#### *OF THE SUPPRESSION OF URINE.*

**T**HE disease here meant to be treated of, is that suppression which is occasioned by collection of urine in the bladder, and an inability, from some accidental cause, to evacuate it. A simple suppression may arise from a disorder in the kidneys ; but, as in this case, the affection is quite beyond the reach of chirurgical aid, we do not mean to consider it, as it belongs entirely to the physician to find out a proper remedy. The other species, which falls properly under the cognizance of the surgeon, is by no means

VOL. II.

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uncommon,

uncommon, and frequently occasions much misery, nay even death itself, to the unhappy patient. It may arise from various causes. 1. A paralytic disposition of the coats of the bladder, without any such affection of the sphincter. Hence, as the latter is endowed with a considerable contractile power, it keeps the mouth of the bladder always close shut, while the coats of that viscus, having entirely lost their power of contraction, can make no effort against it to discharge the urine, but yield to the constant impulse of the liquid continually flowing from the kidneys, and thus become distended to an amazing degree, or even ruptured. 2. It is very common in pregnant women, especially during the first four months of pregnancy; and is then occasioned by the distended uterus pressing upon the neck of the bladder. This kind of suppression is frequently violent, and as capable of producing dangerous and even fatal effects as that which proceeds from any other cause; and there are instances of ruptures of the bladder happening during pregnancy, or in the time of labour. 3. It may be occasioned by schirrosities of the prostate gland, by tumors in the urethra, in the vagina, or other parts in the neighbourhood of the bladder. 4. A prolapsus uteri or vaginæ frequently occasions a suppression of urine. 5. It may be occasioned by an inflammation in the neck of the  
the



the bladder, which is one of the most dangerous species of it ; or, 6. A suppression of urine sometimes takes place in hysterical patients, and is entirely owing to an affection of the nervous system.

The most common cause of a suppression of urine, when a primary disease, is a paralytic affection of the coats of the bladder; and, though this is frequently conjoined with a similar disease throughout the body, yet it often takes place in the bladder alone. This most dangerous affection is frequently brought on by retaining the water too long, especially when drinking diluted spiritous liquors ; all kinds of which are very diuretic ; and thus the bladder soon becomes so distended, that it loses all power of contraction. Such a practice therefore ought by all means to be avoided ; and, as soon as any considerable inclination to void urine is felt, the calls of nature ought by all means to be obeyed, even though at the expence of some of those rules of delicacy which are proper to be observed on other occasions. It was owing to too great modesty, in this respect, that the celebrated astronomer Tycho Brache lost his life. In cases of pregnancy, or when the disease is occasioned by schirrosities, or other tumors, no management whatever can prevent it ; but the inflammatory affection of the neck of the bladder often arises from improper treatment

treatment of gonorrhæas, where the inflammation has been allowed to proceed backwards along the urethra; and it has been known to arise from an unskilful use of astringent injections. It may indeed also be occasioned by those causes which produce inflammation in other parts of the body; though I believe this happens more rarely in the bladder than other internal viscera.

In all cases, where the suppression has continued for any length of time, and unless it has done so, the surgeon will not be called, recourse ought immediately to be had to the catheter, which will very often effect a complete cure, in that species of the disease where an over distension of the bladder, by retaining the water too long, has been the cause; though sometimes indeed the bladder, having once lost its contractile power, never regains it; and, where any symptom of a continuance of this paralytic affection appears, recourse ought immediately to be had to the catheter, as soon as an inclination to void urine without any power to do so is felt. Sometimes, however, in cases of suppression of urine, the neck of the bladder is found to be so irritable, that the patient cannot bear the introduction of the catheter so frequently as is necessary; on which account it has been recommended to leave the instrument in the bladder for a considerable time; but here, again, some inconveniencies

niencies occur ; for the catheter, by a long continuance in the bladder, occasions as much, if not more irritation, than the frequent introduction of it ; and is likewise extremely apt to be covered with a calculous crust, which in all cases is deposited from urine upon any foreign body, and in some constitutions very quickly, especially upon any metallic substance. Where it is wished, therefore that the patient should retain an instrument of this kind in the bladder for any length of time, it will be proper to use one made of elastic gum, which is less liable to irritate, or to cause the urine deposite its sediment.

Where tumors are the cause of a suppression of urine, it is vain to expect any radical cure, except by their dispersion or extirpation ; but, where any inflammatory affection is the cause, recourse ought to be had to blood-letting, both general and topical, as well as the warm bath, opiates, and other remedies capable of abating inflammation, and easing pain in other parts of the body. In this case a larger quantity of blood than is otherwise usual may be drawn from the arm ; and leeches ought to be applied to the perinæum, as near to the seat of the disease as possible. The opiates ought likewise to be given in large doses ; and injections of warm milk and water, with sixty drops of laudanum, may be frequently thrown up, with advantage to the patient. Sometimes, however, the disease re-  
mains

mains obstinate, in spite of every thing that can be done, and it is found to be impossible even to introduce the catheter. A surgical operation, viz. puncturing the bladder itself, then becomes indispensibly necessary, to save the patient from death; but, though this operation has been long known and recommended, authors have not agreed upon the proper place for performing it to the best advantage. Some have advised the puncture to be made a little above the pubes, others to pierce through the urethra, prostate gland, and neck of the bladder; and it has been proposed to puncture the bladder through the perinæum. The first method seems to be very proper, and has been most generally approved by modern practitioners. It is undoubtedly the most easy to be performed, as we can scarce err in penetrating the bladder in a very distended state, if we come within three inches of the pubes; but the most proper place for the puncture is about an inch or an inch and an half above the symphysis. In performing the operation, there is not the least occasion for one making any extensive division of the integuments, as some writers have recommended; on the other hand, it may be done with equal safety and advantage, by pushing a trocar at once through the skin and muscles. A surgeon ought to be possessed of several of these instruments

ments of different lengths ; for, though a canula of an inch and an half long may be sufficient for most patients, two inches will be requisite for such as are corpulent. The length of the canula is a matter of some consequence ; for, where it is too long, as it is always necessary to leave it for some time in the bladder ; there is danger of its injuring the opposite side ; and indeed we have an instance of too long a trocar penetrating not only the opposite side of the bladder, but the rectum also. It must also be observed, that, when a canula is left too long in the wound, the calculous crust will concrete upon it, to such a degree, that it cannot be withdrawn, without giving much pain to the patient ; for which reason, it ought to be taken out every three or four days, and carefully wiped from the fordes which adheres to it. During the time that it is in the bladder, the canula ought to be secured in its place, by pieces of ribbon or tape fastened to it, and passed round the body of the patient. It is almost unnecessary to add, that it ought to have a small cork fitted to it, by which means the urine may be let off at intervals, and the patient kept dry, without being annoyed by the continual flux of water. We shall only further observe, that, in performing this operation, as it is always of consequence for the surgeon to know the precise

moment that the bladder is pierced. For this reason, the filette of the trocar ought to have a groove along the side of it, along which the urine will flow as soon as it enters the bladder; and thus there will be no danger of wounding both sides of the bladder, which otherwise might sometimes happen. At any rate, in the hands of a skilful surgeon, the want of resistance will be a sufficient proof of his being in the bladder, whether his filette be grooved or not. When the canula is taken out of the wound, in order to be cleared, as above directed, it will be proper to introduce a probe in its stead, along which the canula may be replaced, without any danger of hurting the patient, or missing the opening in the bladder.

But, though the method just now recommended, of puncturing the bladder above the symphysis of the pubes, has been found in most instances to succeed, it is by no means to be considered as absolutely unexceptionable. From the situation of the canula, it is evident that the bladder must be suspended upon it, at least one half of it, when the patient is in an erect posture, as much as a bag is suspended by a nail driven through it; and this of itself may be sufficient to injure that tender and irritable organ. But, 2d, There is danger of the bladder slipping off from the trocar altogether; in which case, there would probably be a necessity for repeating  
ing

ing the operation, of which an instance is given by Mr Daran. And 3d, There is some danger, when the bladder is perforated in this manner, of the urine making its escape into the neighbouring parts. For all these reasons, it has by many been thought preferable to puncture the bladder through the perinæum, and which may be done without giving the patient more pain than in the former method. To puncture the bladder through the perinæum, the patient must be secured on a table, as when the operation for the stone is to be performed, and a sound ought to be introduced to the neck of the bladder; an incision is then to be made, beginning immediately at the under edge of the bulb of the urethra, and membranous part of the urethra, continuing it for about an inch and an half towards the anus, parallel to the rapha perinæi, and about half an inch distant from it on the left side. As the bladder, in such cases, is commonly very much distended, it is generally easy to be distinguished; but, at any rate, there can be no danger in pushing in the trocar a little above the prostate gland, and somewhat to the left side of the sound, which acts as the best conductor; in this way the urethra, the ureters, and vasa deferentia, will easily be avoided, by directing the point of the instrument a little upwards, and as soon as the bladder is pierced, the efflux of urine through the groove of the stilette will discover it.

Some have proposed to puncture the bladder through the rectum, by introducing a curved trocar into the anus; but this cannot be attended with any advantage which may not be attained by the other methods, and has besides this capital defect, that thus a passage is formed between the anus and bladder through which the fæces may get into the latter, and thus occasion grievous distress. In females the puncture is most conveniently made from the vagina; and when the bladder is pretty much distended, it may then be readily distinguished by the finger. In performing this operation on women, the surgeon is first to introduce the forefinger of the left hand into the vagina; and, conducting the point of the instrument upon it, it should at once be pushed into that part of the bladder where it is most plainly distinguished by the finger; when the urine is fairly drawn off, the trocar ought to be left in the bladder, till the suppression be removed by other means. In operating upon females, the trocar ought to be of a length sufficient to come without the vagina, that it may be secured with pieces of tape, as already directed, which ought to be connected with a circular bandage, for the greater convenience to the patient. It is needless here to remark, that the canula must be regularly removed as directed.



## CHAP. II.

## OF THE INCONTINENCE OF URINE.

THIS disease is directly the reverse of the former; for, as in it, the urine was continually flowing into the bladder, without any power of expelling it; so here the liquid constantly flows out, without any power of retaining it. It may arise from various causes; as, 1. From irritation on the neck of the bladder by stones. 2. From a paralysis of the sphincter of the bladder, while the contractile power of the bladder itself, or the muscle named *detensor urinæ*, remains the same as usual. 3. From laceration of the parts in the extraction of large stones. This is apt to produce a paralysis of the sphincter after the wounds are healed up, or of the foetus in women.

When an incontinence of urine proceeds from an irritation of the neck of the bladder by a stone, it cannot be radically cured but by the operation of lithotomy; though great relief may be given by mucilaginous and anodyne medicines, particularly given in the form of injections. In the other two cases, where it is occasioned by a paralytic affection of the sphincter, we can only attempt the cure by such medicines as are proper in other paralytic cases, viz. the Peruvian bark, chalybeates,

chalybeates, the cold bath, and other tonics ; but, of all other topical remedies, cold applications to the perinæum are found to be the most effectual. The most powerful remedy of this kind is to dash cold water upon the part; though it is sometimes found useful to apply cloths dipped in vinegar and water, or a solution of saccharum saturni in the acetous acid.

When no relief can be obtained by the above proposed remedies, we must then have recourse to some mechanical method of compressing the urethra, and thus preventing the continual dribbling of the urine, which cannot but be very disagreeable. A very proper instrument of this kind, called a *jugum*, or yoke, is represented Plate I. Fig. I. The method of applying it is obvious from the figure. It ought to be lined with silk or velvet ; and, by means of the screw, the pressure may be made greater or lesser at pleasure. For women we must make use of pessaries, which must be made of sponge, only of such a size as to be easily admitted, and, before it is introduced, it must be moistened with the finest olive oil, which most effectually prevents it from becoming so soon troublesome by excoriating the vagina. Pessaries made of wood can never be used in cases of this kind with effect ; for, in placing them in the vagina, so as to compress the neck of the bladder, it

it is obvious they must at the same time press upon the rectum, and, on that account, prevent the natural passage of the fœces. In some particular cases, even these palliative remedies prove ineffectual; for, when the disorder proceeds from an irritation on the neck of the bladder, the patient has such a continual desire to make water, that it is impossible to bear any confinement of it. We can then only adopt proper receptacles for collecting it as it flows. In women these can only be by pieces of sponge, applied externally, and kept in that situation with a T bandage; but in men they may be made as expressed, Plate 1. Fig. 2. It ought to be made to apply to the thighs exactly; and, if fixed to a circular bandage round the body, will remain firm enough, while it admits of any change of posture in the patient's body.

In the Medical Observations, we have some surprising instances of the efficacy of blisters in removing this complaint. A girl of 13 years of age, who, for four years, had been able to retain her water only a very short time in the day time, and not at all during the night, was cured in 24 hours by the application of a blister to the os sacrum. A man of 32 years of age was attacked by this disease, accompanied with a palsy of the lower extremities, in consequence of having taken some virulent quack medicines, probably

bably of the mercurial or arsenical kind. In 24 hours after the application of a blister to the os sacrum, he was able to retain his water for an hour, and in a week after, for two hours. In about a month he was able to retain it for five hours, and at last obtained a perfect cure. He also recovered in some degree the use of his limbs, which were paralytic. The like good effects were produced on a woman of 50, in whom the disease had been brought on by a strain. In her it was likewise accompanied with a palsy of the lower extremities, and of this too she got the better. In a woman of 43, in whom the disease seems to have come on without any evident cause, the cure was accomplished almost during the time that the blister rose. In a young man who had been attacked with the disease after lifting a heavy load, a cure was accomplished in 16 days. A man of 44 years of age, who had been attacked by the disease without any evident cause, was in like manner cured on the first application of a blister. This man had likewise symptoms of a diabetes, but the blister had no effect in removing them. A boy of ten years of age had violent complaints in the urinary passage, which were supposed to proceed from an ulcer. "When about to make water, he was obliged to put himself in a prone posture, and then his urine generally came away  
by

by drops, with exquisite torture. At length it began to come away insensibly during the night;" but, by the application of a blister, this incontinency was removed in less than 48 hours, the other symptoms remaining as they were. In all these cases, the blisters were very large, covering not only the os sacrum, but extending from side to side.

### CHAP. III.

#### OF THE FISTULÆ IN PERINÆO.

THOUGH this name may be with propriety applied to every sinous ulcer occupying any part of the perinæum, yet, by the general consent of practitioners, it has been limited to those which have some communication with the urethra, so that, by means of the openings of these ulcers, there is a ready passage afforded for the urine. By the word *fistula* we understand every ulcer which runs deep, and discharges its contents through a small orifice; and that whether the edges or lips of it are become callous or not. It is remarkable that though some of these fistulæ have a number of external openings, so that the urine is discharged by them in some measure,

measure, as through the spout of a watering pot, yet it never has been found, on dissecting such as have died of this disease, that there was more than one opening in the urethra. This generally takes place between the neck of the bladder and bulbous part of the urethra, as in that place the latter is considerably weaker than any where else; but the external openings are found not only in the perinæum, but the scrotum, and even in the groin. Sometimes this disease takes place without any affection of the neighbouring parts; and there is only a single opening through which matter is discharged along with the urine; but in other cases, all the parts around are found very hard, callous, inflamed and painful. Where the disease is very inveterate, the whole perinæum is sometimes found in a state of callosity, and the scrotum, and even the under part of the penis are affected. And the patient is rendered very miserable by the lodgement of the urine in the cellular texture of these parts.

This disease may be occasioned, either by external injuries, as from lithotomy unskilfully performed, wounds of the urethra and bladder, obstructions in the urethra by stones, &c. or by inflammation and abscess, as in other parts of the body. By any one of these causes a passage may be formed for the urine, through  
the

the external integuments ; or, by obstructions in the urethra, the canal itself may burst ; but, in attempting a cure, we must not only carefully attend to the cause by which the disease is immediately produced, but consider whether it be not connected with some general disorder of the system ; for, if the latter happens to be the case, we cannot expect that a radical cure can be effected, until the disease, whatever it is, by which the whole system is affected, be removed. When this disease (the fistula) has been occasioned by any obstruction in the urethra, it is impossible to effect a cure, without first removing the obstruction. If it is a stone, this must be extracted in the manner already directed ; but, if there is any caruncle or carnosity, it must be taken away by the methods already directed ; and, when this is done, the fistula will commonly heal in a very short time, by the application of moderate pressure. If it does not, the reason will most probably be, that the edges of it are become hard and callous. These must therefore be destroyed as soon as possible ; and the best method of doing so is by the following operation. Having secured the patient on a table, as in performing the operation for the stone, a grooved staff is to be introduced into the urethra, till it pass beyond the opening through which the urine is discharged. In this situation it is to be

held firm by an assistant, and the surgeon is to introduce a probe through the external opening, the whole length of the sinus, till it reach the staff. After having distinctly felt the point of the probe rub against it, he is to cut upon the probe as a director, and must lay open the sinus throughout the whole of its length, until he arrives at the staff, although it should reach the very bladder itself; and in this manner it will be necessary to lay open all the sinuses; but, when the parts through which they run have become preternaturally hard, it will be found perfectly sufficient only to cut through these in different parts with the scalpel, as, in general, the suppuration ensuing on the division of the parts now recommended is sufficient to remove any little callosity; but, when these callosities are too extensive to be dissolved away in this manner, we must then have recourse to the knife, as already mentioned; but the operator himself must always judge of the quantity to be removed.

Having laid open the sinuses, and removed what part of the callosities the operator thinks proper, it will be necessary to interpose a pledget of soft lint, spread with some kind of emollient ointment, between the lips of the wound, to prevent them from growing together till the wound heals up from the bottom. The dressings must  
be



be secured by a T bandage, as in other wounds of those parts of the body. If there is much pain, or other symptoms of inflammation, an emollient poultice is to be applied within twenty-four hours after the operation, and great attention must be paid to the dressings, throughout the whole course of the cure, as more depends upon this attention in the disease we treat of than in most others. Some recommend the use of a bougie or catheter after the operation, which they would have constantly kept in the urethra, except at the time of voiding the urine. The design of this is to prevent any contraction of the urethra, or the urine, from flowing too long by the wound; but, when we consider that, in the case of lithotomy, where the wound is much greater, and consequently also the danger of the urine passing by it, and yet no bougies or catheters are either ever recommended or used there, we surely cannot suppose that there is any good reason for insisting upon the use of them in a fistula in perinæo, where there has been no previous obstruction in the urethra. It is likewise also certain, that the use of these instruments, instead of forwarding the cure, may make it more tedious and painful; neither are we to expect any good from a long continued use of poultices to the diseased parts, or from mercurials, which some have very warmly recommended,

commended, though no doubt there are cases in which all these may be necessary ; but, where they are so, the surgeon must be determined by his own judgment and experience, as it is impossible to lay down any general rules.

The following cases have fallen under my own observation, and will illustrate what has been already said. The first is somewhat remarkable.

J. J. a man of 46 years of age, after a  
severe debauch with malt liquor, was seized I.  
with a strangury. On making a very strong effort, he found something, as he expressed it, give way about three inches from the point of the penis, when to his great astonishment, the bladder was suddenly emptied without a drop of water passing in the natural way. Immediately after this, a swelling with severe pain took place in the scrotum. Twelve hours after the accident, I saw him : he was almost distracted with pain ; the tumor very hard, and much inflamed, reaching from the ring of the external oblique muscle to near the middle of the thigh, and of a thickness proportionable to its length. He was extremely restless, his pulse very quick, and rather feeble, and on every attempt to make water, he was sensible of its passing into the tumor ;

mor ; which was thus continually augmented in size, with a proportionable increase of pain.

As the patient had enjoyed good health before this time, and had never been affected with any venereal complaint, I concluded that the whole arose from a complete and strong contraction of the urethra, so that the canal itself had burst immediately above the scrotum, and discharged the contents of the bladder into it. Concluding therefore, that the contents of the tumor could be nothing but urine, I pushed an abscess lancet directly into the tumor, near the centre, that is, about an equal distance between the abdominal ring and bottom of the scrotum. About six pounds of urine gushed out, with almost immediate relief to the patient ; the wound was dressed superficially, with a little caddice moistened in oil, and gently inserted between its lips ; the whole scrotum being afterwards covered with cloths dipped in solution of lead. On attempting to introduce a bougie, I found that it could not be made to pass further than two inches and an half, or at most three inches into the urethra ; and it was four hours after the operation before I could pass a bougie of the smallest catgut through the obstructed part. During this interval, the urine passed wholly through the wound ; but, in twenty-four hours a bougie of considerable size could be introduced ;

ed ; and, on removing this when the patient had a desire to void his urine, some of it always flowed the natural way, though the greater part continued to pass by the scrotum.

Thus, in a short time, the pain and inflammation of the parts began to abate ; but, by the continual discharge of urine into the scrotum, a swelling took place in the testicle, which sensibly increased every time he made water. To take off this disagreeable symptom, I drew off his urine regularly by the catheter four times a day, by which the continual addition of stimulus was prevented ; he was also bled at the arm, and ten leeches afterwards applied at proper intervals ; the whole being properly suspended, and kept moist with solution of sugar of lead. Thus, in six days from the time I began to use the catheter, the swelling was totally removed ; but on laying it aside for twenty-four hours, though he now passed more than one half in the natural way, the swelling began to return, recourse was again had to the catheter, which it was found necessary to continue for three months, before the opening in the urethra was quite closed.

During all this time the wound in the scrotum was carefully kept open, and every ten days an attempt was made by the patient to void his urine naturally, that it might be known wheth-

er the opening in the urethra was healed or not. As this opening diminished, the quantity of urine passing by the wound was also diminished, and the cure was at last so complete, that for ten years he has enjoyed perfect health, without the least return of any symptom that could be supposed to arise from the former complaint. In this case, finding the absolute necessity there was for preventing the urine from running through the wound, I proposed to use the elastic catheter; but, after the patient had used an instrument of this kind for two days he was obliged to give it over, on account of the uneasiness it occasioned, particularly a desire to make water almost every half hour. On this account I had recourse to the metallic catheter, as being the only method in my power to prevent the testicle and scrotum from suffering much by the constant irritation of the urine.

J. M. C. a man of 42 years of age, had  
like the former patient, a stranguary after  
hard drinking. His complaint continued very  
severely for fourteen days, after which he observed a swelling of considerable size at the root of the penis, near the anus. By advice of a medical gentleman who attended him, he put a poultice to this tumor, in consequence of which, it was brought to suppuration, and broke of itself. A  
considerable

considerable quantity of urine was voided through the opening, and this quantity continued daily to increase, appearing daily to insinuate itself more and more into the cellular substance of the perinæum, and producing an high degree of inflammation attended with great pain, and all the symptoms of an acute fever. Thus one suppuration succeeded another, until at last he was reduced to great distress, and applied to me after six months illness. He was then very much emaciated; his scrotum swelled to nearly four times its natural size, very much inflamed; and in some places of it were sinous openings, from which a considerable quantity of matter was discharged, part of it always coming along with the urine. There were two sinuses on each side of the rapha near the anus, through which matter was also discharged; the whole perinæum from the anus was very much swelled, and felt callous; in short, when he voided his urine, it passed through twelve different holes in the scrotum and perinæum, attended with the discharge of much matter, and most exquisite pain.

On examining this man particularly, I found, that about four years before, he had had a gonorrhœa, which had lasted for five months; and, though then apparently cured, he had always a return of the running, with some degree  
of

of ardor urinæ, after any slight debauch ; but these complaints constantly went off, upon taking a dose of cream of tartar, or Glauber's salt, and keeping himself moderately cool for a few days. When I first visited him, he had no pain or uneasiness in the perinæum, or under part of the scrotum ; for that always went off after a perfect suppuration and free discharge of the matter, though the rest of the symptoms continued as before. The inflammation went on very gradually, and seemed to be occasioned by the urine insinuating itself more and more into the cellular substance, which it inflamed as it went along. He passed very little water in the natural way ; and, from a supposition that his case was venereal, he had taken such a large quantity of mercury, both internally and by friction, that his mouth had been very severely affected for near three months ; the parts had also been covered with large emollient poultices of many different kinds, and he was become so weak, that he could not rise out of bed. It had often been attempted to pass a small bougie into the bladder, but without success, on account of a stricture near the neck. After several efforts, however, I was more fortunate, and got it completely introduced. At first, he was able to retain it only for about fifteen minutes, four times a day ; but, by gradually lengthening the

time, while the size of the bougie was likewise increased, more and more of the urine came to be voided in the natural way; all the bad symptoms decreased, and he began to recover his strength. Persevering in the use of the bougie for three months, the whole of his urine at last passed the natural way. On account of the fætor and bad condition of the ulcers, I made use of the carrot poultice; by the continuance of which, I had the satisfaction to find, that the hardness and pain gradually went off, and all the bad symptoms at last disappeared. He has now continued well for four years, but generally introduces the bougie once in twenty-four hours, and keeps it in for an hour at a time.

J. D. 36 years of age, having drunk rum punch very freely one afternoon, was attacked with a difficulty of making water, attended with heat, and frequent and very painful urgings to void his urine, which after all passed only in drops. In consequence of the continuance and increase of these symptoms, he had been obliged to make use of the catheter twice a day for fourteen days, after which his urine passed the natural way, though still with great pain and difficulty. In four weeks from the first attack, I saw him. He had then a swelling in the perinæum of the size of an hens egg; which,



which, being pretty soft, I opened at the most prominent place with a lancet, and thus gave vent to about two ounces of matter, seemingly of a good quality. An emollient poultice was applied over the dressings, and ordered to be renewed every two days. Thus the swelling soon disappeared, as well as the other bad symptoms; but a few drops of urine were now observed to come away by the wound every time he made water. This continued for several weeks, during which time the external wound was carefully kept open, by inserting a little caddice dipped in oil between its lips, to prevent the urine from insinuating itself into the cellular substance, but when the discharge in this way had stopped, the opening was allowed to heal up, and the patient went to the country, thinking that his cure was complete. But, in about twelve months after, after being fatigued, and getting cold, he was again attacked by his disorder, the stranguery. It was soon got the better of, by using the cluniluvium, and keeping moderately cool; but after it went off, he perceived a little fulness in the cicatrix of the old wound. On applying poultices for three days, it broke, and discharged a quantity of matter mixed with water. Having been in the custom of dressing his wound formerly, he treated it again in the same way, but not with the same success; for the urine  
having

having insinuated itself into the cellular substance lying backwards in the neighbourhood of the anus, a considerable swelling took place, attended with great pain and inflammation. At last it broke in two different parts near the verge of the anus, and he was obliged to apply to me.

At the time I saw him again, the urine was discharged at three openings, the one near the bulb of the urethra, and one on each side of the hips; the sinus of the former running downwards and backwards to the neck of the bladder, and of the two latter upwards and inwards to the same place. The adjacent parts were much hardened, the openings become truly fistulous, and the hardness and pain constantly spreading over new space; but there was no obstruction to the passage of the urine in the natural way, and the quantity of matter discharged with it never exceeded half an ounce at a time. As it now appeared necessary, however, to lay open all the sinuses to the bottom, I prepared him by a gentle laxative and injection, after which I began the operation by introducing into the neck of the bladder the grooved staff used in lithotomy, a strong probe into the sinus on the right side of the rapha, and with a round edged scalpel laid the whole open to the bottom. In like manner I proceeded with the rest, and found that

that all the three terminated at the membranous part of the urethra. Near the neck of the bladder a small opening was discovered in the urethra, near the prostate gland. I enlarged this opening in the urethra to half an inch, to promote the free discharge of urine during the supuration of the callous edges of the ulcer. The wound was slightly dressed with caddice dipped in oil, and the patient put to bed, and afterwards treated in the same manner as if he had been cut for the stone.

The first time this patient made water after the operation, more than one half of it passed by the wound, and this continued for six days, for the last four of which the parts were constantly covered with an emollient poultice, to promote the digestion of the hardened parts. In 14 days, little or no water was discharged by the wound; and during the whole course of the cure no medicine was found necessary, excepting twice an injection. The wounds healed up in the same manner as those which heal favourably after the operation of lithotomy. In about eight weeks they were completely whole, and for three years and an half he has remained free of every complaint.

J. S. a man of 32 years of age, after  
hard drinking, and getting cold, com-

IV.  
plained

plained of frequent inclination to make water, attended with great pain, while his urine passed only in very small quantities. His pulse being 100, and rather full, and his belly bound, he was bled to ten ounces, and had an injection of a drachm and an half of turpentine dissolved in two drachms of the yolk of an egg, to which were added twelve ounces of linseed tea, and 80 drops of laudanum. After the injection, he sat for half an hour in a warm bath, and at bed time had a bladder filled with warm water applied to the perinæum. The bleeding and injection were repeated next morning ; and by a continued use of these and other similar remedies, he was cured of his complaint in about eight days from the first attack. In three weeks, however, I was again sent for, and found him complaining of a pain in the perinæum, where was a small tumor, about the size of a walnut, painful and hard to the touch, but without any fluctuation, or sign of its containing matter. Every attempt was made to resolve it, without success; it was therefore opened as soon as any fluctuation could be perceived, with a lancet, and, as it was of a very small size, little matter was discharged. An emollient poultice was applied, and kept on by a T bandage ; by the use of which the hardness was removed, and the wound soon healed ; but next morning, on making water immediately

mediately after getting up, he was alarmed by a tumor which instantaneously arose in the place of the old one, attended with a quick and sharp pain. I was immediately sent for, and on examining the part, was convinced that the tumor was filled with urine, and that there was a small sinus communicating with the urethra, which had thus occasioned the sudden tumor. I therefore opened the old cicatrix with a lancet, and discharged about a tea spoonful of urine. It was now necessary to prevent the external wound from healing until the small opening in the urethra should likewise be closed; for which purpose a small silver tube, with two wings, as represented in Plate 1. Fig. 8. was procured. It was about two thirds of an inch in length; and, being introduced into the external wound, was kept there by a bit of adhesive plaister. He continued to void some urine through this tube for six weeks, during all which time he walked about, and attended his business without the least inconvenience. After this time the discharge of urine entirely ceased. He kept in the tube for a few days longer; but finding nothing more discharged, he took it away, and the wound healed up. He continued well for fifteen months; when, on coming out of the sea, where he had been bathing, he was attacked with chilness, shivering, and other febrile symptoms,

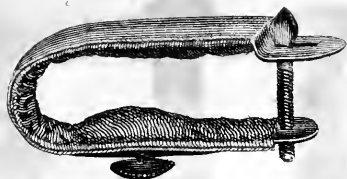
symptoms, which, in two hours terminated in a slight strangury. This was entirely removed by a dose of Rochelle salts, but the water instantly penetrated again into the cellular membrane of the perinæum, and was again let off, and the instrument used as before, with the same success. He has now been two years free from any complaint, but has taken care not to make free with his constitution, either by drinking or otherwise.

#### CHAP. IV.

#### OF THE HÆMORRHOIDS.

THIS distemper, called also the *piles*, was originally supposed to consist in a flux of blood from the rectum; but, by a more enlarged sense of the term, it is applied to any considerable distension of the veins near the rectum, even though there be no flux of blood from them. There is, however, still a distinction made in this case; for, when the distended veins do not bleed, the swellings are termed *blind piles*, but when they do, they are said to be *open*. The distemper, though very painful, is not generally mortal, or even dangerous, though there are instances of people having expired suddenly by a flux  
of

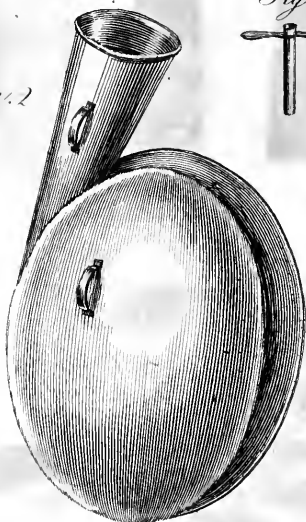
*Fig. 1.*



*Fig. 8.*



*Fig. 2.*



*Fig. 3.*



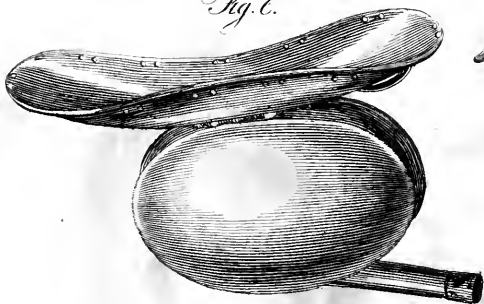
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



*Fig. 7.*





of blood from the anus ; and thus died the heretic Arius, and the celebrated philosopher Copernicus.

The most troublesome consequence of this disorder is the extreme pain with which they are commonly attended ; though this, too, is greater or less according to the situation of the tumors. When seated far up in the rectum, the pain is much less than when farther down ; for, in the former case, the veins are surrounded by soft and yielding substances, which easily yield to the pressure, and allow the swelling to go on ; but, where the intestine is surrounded by the sphincter ani, which has a considerable degree of muscular firmness and strength, the veins are confined by it, and their distension is attended with most remarkable pain.

It is owing to this difference in situation, that sometimes the patient has no warning of his disorder till he discharges blood by the rectum ; and thus, if the swellings have been extremely large, such a violent flux may at once ensue, as is sufficient to carry him off, without any previous complaint. When the tumors are situated so far down that they can be seen, there are perceived, in the open kind, certain small orifices, from whence the blood oozes out, each of which appears seated upon a small rising on the inside of the gut. In this case they are commonly but

small; though, when the swelling goes on for some time without any discharge of blood, they sometimes arrive at the size of pigeons or even hens eggs, attended with the greatest pain, besides a tenesmus, and other troublesome symptoms. Even when they burst, the swellings do not entirely subside, nay sometimes they continue nearly of the same size they originally were, acquiring a firm, fleshy consistence, and a dark livid colour, though soft and yielding to the touch before they broke. Sometimes they are of such a size as to fill the cavity of the rectum almost entirely, and thus prove a great obstruction to the passage of the fæces; while the misery of the patient is aggravated by the frequent, or almost constant inclination to go to stool, with which he is at the same time also affected. The hardness of the large blind piles already mentioned, is occasioned by an effusion of blood into the cellular substance, which surrounds the veins of those parts; for, though, in the beginning of the disease, the veins certainly do dilate without bursting, yet this cannot be the case where they have attained to any very considerable size; and, in general, we may always conclude, that, unless when the hæmorrhoids are soft and easily compressible, there is undoubtedly an effusion of blood into the surrounding cellular substance.

As.

As this disease very seldom proves mortal, we find an opinion has been pretty generally adopted, of its being of a salutary or critical kind of nature; an evacuation by which some peccant or morbid matter is thrown off from the body; and hence patients have frequently been taught to submit to all the pain and uneasiness it occasions, rather than to seek for a remedy. This opinion, however, does not appear to be well founded; for, granting that there was any morbid matter in the body, it is impossible to assign any reason why it should be collected in the blood which fills the dilated veins adjacent to the rectum, more than any where else; and, unless we can assign this reason, we can have no foundation for our opinion. The opinion itself appears originally to have arisen from the obscurity of the cause of the hæmorrhoids, which indeed, it must be confessed, is somewhat less evident than that of many other diseases; but, in by far the greatest number of cases, the disease is most evidently perceived to have arisen from compression on the hæmorrhoidal veins. This pressure may be occasioned by hardened feces, which indeed is the most common and universal cause; or it may arise from a gravid uterus, from tumors of the prostate and mesenteric glands, or in the rectum. In all these cases, except

cept the first, it is evident that the hæmorrhoids are only a secondary disease, and cannot by any means be removed until the primary affection, on which it depends, is taken away. In cases of pregnancy, a cure can only be hoped for after delivery, or where there are tumors after their dispersion or extirpation. Where costiveness is known to be the cause, gentle laxatives are to be used, by way of prevention; but neither these, nor any medicine whatever, taken internally, can be supposed of much use in removing the pain and other troublesome symptoms arising from piles already formed. To this indeed the balsamum capivi seems to be an exception; for, when taken in doses, from 50 to 80 drops, in a morning, it very often removes the pain and uneasiness of the piles, answering at the same time for a gentle and easy laxative. External remedies, however, are most to be depended upon. In cases of great inflammation, and where the patient is attacked by any degree of fever, venesection will be proper; but bleeding with leeches, applied near the anus, is found to be the most efficacious for removing the disagreeable symptoms, and the nearer they can be applied to the seat of pain, so much the better. It is also of considerable use frequently to bathe the parts with a solution of saccharum saturni, and to keep the patient on a low and cooling diet. An ointment,

ment, composed of equal parts of finely powdered galls and hogs-lard, has been also found very efficacious, and preferable to any of the ointments composed of sulphur, some of which have been very much commended. This, as well as the balsamum capivi was recommended by the late Dr Cullen.

In many cases the remedies above mentioned will prove effectual in giving ease to those affected with the hæmorrhoids; but, sometimes the disease attacks with such violence as to require a surgical operation. Where the flux of blood, in the open piles is of such magnitude as to threaten danger to the patient, every method must be taken to stop it, by compression, or rather by securing the bleeding vessels by a ligature; in doing which the tenaculum is to be used rather than the needle; because, when the latter is made use of, a considerable portion of the gut must always be included along with the vessel. When the blind piles arrive at such a size as to obstruct, in any considerable degree, the passage of the fæces, they ought, if possible, to be extirpated. This is easily done when they are quite in view, or even when situated some way up the rectum, they may be brought in sight by the patient pressing down pretty strongly, as if going to stool. When thus brought into view, they ought immediately to be removed  
by

by the scalpel, unless the size of them be such as to threaten a dangerous hæmorrhage; and in this case they are to be removed by ligature, the manner of doing which is as follows. Pass through the basis of the tumor a needle armed with two strong waxed threads, and then, turning one thread round one half of the tumor, and the other round the other, tie them in this manner, and leave them to drop off with the tumor, which will be in three days at farthest, sometimes in two, or even less; but, three days are generally required; nor are any dressings requisite when the ligature is employed; but, if the extirpation is performed by the scalpel, the part may be dressed with soft lint spread with any kind of emollient ointment. Writers on this subject, commonly direct such tumors of the hæmorrhoidal kind as adhere by a small neck to be taken off by ligature, while those with a firm broad basis require the use of the scalpel. But there can be no good reason for making this distinction; and in every case where the tumors are not of such a size as to threaten a dangerous or fatal hæmorrhage, excision is undoubtedly preferable to ligature.

## CHAP V.

## OF THE FISTULA IN ANO.

THIS term is applied to any finous ulcer in the neighbourhood of the anus, or extremity of the rectum; but, to use it in such an extensive sense, in the opinion of some eminent practitioners, particularly Mr Pott, is very improper; and tends to convey false ideas on the subject. He observes, that former physicians connected the idea of callosity with the term *fistula*, in whatever part of the body it was situated, provided the sore at the same time discharged a thin gleet or sanious matter. Abscesses in the neighbourhood of the anus are very frequently converted into fistulous sores, from neglect, bad habits, &c.; but the greater number of them have, at first, none of the characters of true fistulæ. It is common for tumors raised by inflammation in any part of the body to burst, if not opened in proper time; and as the hole thus formed is often but of a small size, and not situated in the most dependent part, whence the matter can be evacuated most easily, it frequently remains open for a long time, the matter oozes out slowly, and the sides of the opening become callous. The parts in  
the

the neighbourhood of the anus are particularly subject to defluxions of matter, which are apt to form abscesses; and by reason of the softness of those parts, the inflammation and swelling extend a considerable way round, so that the first supuration is by no means equivalent to the dissolution of the hardness, especially if the skin has been suffered to burst, instead of being opened. In such cases the orifice is small, the edges hard, and the cavity into which it leads is often deep, the matter, thin, discoloured and sanious; all which circumstances, together with the induration of the adjacent parts, have tended to give the idea of a true fistula; and upon this notion such a treatment of them has been founded, as has been at times very improper, and unnecessarily severe.

The true fistula makes its attack in several different ways. Sometimes it comes on with strong symptoms of inflammation, violent pain, rigor, and other febrile appearances; and, when the fever goes off, the fistula comes on as a critical swelling. It discovers itself by a large inflamed swelling in some part of the buttock near the anus, to which, in the particular place just mentioned, the name of *phyma* is given; in other parts of the body, such a swelling is called a *phlegmon*. This inflamed tumor is sometimes exquisitely painful, and the fever very high; but,  
when



when suppuration has completely taken place, all the disagreeable symptoms go off, and the patient becomes easy, the abscess being filled with plenty of good matter.

As in the case just now described, the fistula seems to be the consequence of an high inflammatory fever, so may it come on with an erysipelatous or gangrenous disposition of the juices. In the former case, the patient is affected with sickness, pain and, fever; but there is not that distinctly circumscribed hardness which is met with in the *phyma*; the skin has an erysipelatous appearance, and the cellular membrane is sloughy to a considerable extent, and there is but little matter formed. In the gangrenous kind, the appearance is much the same as in that kind of boil called the *anthrax* or *carbuncle*. The skin is of a dusky red, as in an incipient gangrene; the pulse is hard, unequal, and full, with great thirst; and, if the disease be not soon relieved, the pulse sinks with great dejection of spirits, and loss of strength; the matter is of bad quality, and in small quantity, and the cellular membrane is sloughy and gangrenous, as far as the skin is discoloured.

In some cases the fistula comes on with an induration of the skin near the anus, but without any pain or alteration of colour, the hardness gradually softening and dissolving in matter,

which is sometimes of a good quality, and in no great quantity, in other cases very offensive, and in great quantity, the fore having also a very bad aspect, though the pain and inflammation have perhaps been but very slight. These differences are occasioned by the difference of habit and constitution in different patients, as no doubt are the various symptoms which accompany the disease, for in some, the fistula is accompanied with no other complaints than such as usually attend the formation of matter, &c. in any other part of the body; in others, the disease affects the bladder, vagina, hæmorrhoidal vessels, rectum, and urethra; producing such a variety of complaints, as are exceedingly distressing to the patient, and embarrassing to the practitioner. Sometimes the matter is formed in such quantity that the parts about the rectum are much wasted, even though the previous symptoms of pain, inflammation, &c. have been but slight.

In this disease, there is sometimes a considerable uncertainty in knowing the place where the matter would discharge itself. The abscess frequently points at a distance from the anus, sometimes very near it, in the buttock, or perinæum; sometimes there is but one, and sometimes more orifices; the rectum itself being sometimes affected and penetrated, at other times

times not ; and in some cases the abscess is situated so high up, that nothing can be done for the patient's relief. It is not unfrequently the consequence of the venereal disease, in which case the urethra and neck of the bladder are affected, to the great distress of the patient ; and sometimes it is the consequence of a cancerous ulcer in the pelvis, in which case it is absolutely incurable.

From this account it appears that the disease we treat of admits of several varieties, which have accordingly been distinguished and pointed out by surgeons. When any external opening near the anus has a communication with a deep seated ulcer, but without injury to the rectum, it is called an incomplete fistula ; but, when the gut is also perforated, it is then said to be complete. If the rectum is perforated without any external opening, so that the ulcer discharges itself by the anus, the fistula is said to be *internal*, or *occult*. When it affects the bladder, vagina, or any of the parts in the neighbourhood of the anus, it is said to be a compound fistula ; but it is termed only *simple*, though there may be several sinuses communicating with the internal ulcer, provided none of the parts above mentioned are affected.

The fistula in ano is attended with a variety of troublesome, and even dangerous symptoms,  
which

which require the utmost care and attention on the part of the surgeon to alleviate, even independent of any operation he may afterwards perform. It must be observed, that though the parts near the anus are very liable to be affected by abscesses, it is seldom proper to attempt the discussion of such tumors as may be formed there, as they most generally give relief in some former complaint. The business of the surgeon then is to promote the formation of matter, and the maturation of the tumor ; after which it is to be opened, and the sore healed up, as soon as can be done with safety to the patient. As the inflammation with which these tumors are accompanied is of different kinds, in different patients, regard must be had to that in the treatment of the disease, even when no other troublesome symptoms occur. When the tumor is a proper *phyma*, the skin ought to be allowed to be very thin, and all the indurated parts to be softened as much as possible before any operation takes place. As this kind of tumor usually takes place in full and sanguine constitutions, where the powers of life are very strong, it is frequently attended with a degree of fever requiring phlebotomy and a cooling regimen. In other constitutions the inflammation is of an erysipelatous nature, and will by no means bear the evacuations requisite in the former.

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This kind of fistula generally makes its attack with slight rigor, heat, restlessness, thirst, nausea, and vomiting ; but, though, from the heat of the skin, and quickness of the pulse, the surgeon may think that considerable evacuations will be necessary ; yet, if blood be taken away according to these indications, the pulse will sink as if it were in a nervous fever ; or, if he gives cathartics, the inflammation may suddenly leave its original seat, and the most fatal consequences afterwards ensue. In cases of this kind, it is proper to lay open the tumor soon, because the matter is of a putrid kind, and the cellular membrane in a sloughy state. If the disease therefore is left to itself, in expectation that the abscess will show, by coming to a point, when it is about to discharge itself, a great part of the cellular substance will be destroyed, and the cavity of the tumor will be prodigiously augmented.

The case is still worse in the gangrenous kind ; for if, along with the purplish red colour, insensibility of the skin, and other symptoms of an approaching gangrene, there be added a weak unequal pulse, frequent shiverings, and a comatose disposition, the patient generally dies ; but indeed this can only take place in very bad habits, and is most commonly produced by excessive intemperance in eating and drinking. In  
this

this case all the external applications already recommended for a gangrene ought to be made use of, and that without delay ; not forgetting such internal remedies as experience has found to be efficacious in such cases.

If a strangury or dysury comes on, they may commonly be relieved by blood-letting ; but a total retention proves frequently very alarming, and difficult to be removed. This complaint, however, is very frequently spasmodic, and therefore we cannot so freely use the catheter here, as in other cases ; for it is certain that, in a suppression of urine arising from this cause, the patient will often labour under as much pain and uneasiness, when there is no water at all in the bladder, as when there is. When a suppression of urine happens to arise from a spasmodic cause, the neck of the bladder is closely contracted, so that it cannot admit the catheter without a considerable force ; and it is evident, that whatever irritates or inflames any part, while under spasmodic contraction, must do much hurt by increasing the spasm. The resistance also which the neck of the bladder makes to the admission of the instrument, is sometimes so great, that a passage is formed for it some other way, commonly at the caput gallinaginis ; and thus, the most miserable, and even fatal complaints, are brought on, as the instrument  
must

must pass through between the prostate gland and bladder.

In the suppression of urine just mentioned, the proper cure is by gentle evacuations, and anodynes, especially when given by way of glyster. Venesection is necessary; but particular regard must be had to the habit and strength of the patient, in determining the quantity of blood to be taken away. To these we may join the hot bath, but here the cluniluvium is preferable to full bathing, with the application of bladders full of hot water to the pubes and perinæum; by the use of which, we may be almost always certain of giving relief in any suppression of urine arising from a spasmodic cause.

One of the most common attendants on the fistula in ano, and indeed in all other disorders of the rectum, is a troublesome and painful tenesmus in men, and what is called a *bearing down* in women. Both these complaints proceed from the same cause, viz. the irritation constantly attending the disease, and may be cured by the same means, viz. a doze of rhubarb with half a grain of opium; or, should this prove unsuccessful, an injection of starch with opium or tinct. thebaic. may be given with almost a certainty of success. An obstinate costiveness with which the patients are sometimes troubled, may be relieved by venesection, glysters, and a cooling

cooling regimen. The piles may be treated in the manner directed in the last section.

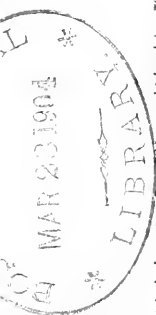
Having removed or relieved all the concomitant symptoms, the surgeon must next proceed to the treatment of the fistula itself; and this must be different, according to the state in which it is at the time. If it happens to be yet in a suppurating state, every method we can think of must be used to bring the abscess to maturity. For this purpose, we must employ poultices, fomentations, and the vapour of warm water; and if these be properly applied, there will be little danger of success. As soon as it is properly ripened, the abscess must be opened in the most depending part, in order to evacuate the matter easily. The opening of this abscess in proper time, indeed, is a matter of considerable importance; for, if the incision be either deficient in magnitude, or has been too long delayed, the matter will not fail to insinuate itself into the cellular substance, and perhaps separate the whole under part of the rectum from the muscles, with which it is naturally connected. In cases of this kind, there are often found a number of sinuses running, in various directions, by the side of the rectum, along the perinæum, or among the muscles of the buttocks; while perhaps, had the opening been made in time, or of sufficient magnitude, there might have been



been only a simple sinus, of no great depth, which in a healthy constitution would easily have admitted a cure. The opening in this, as in other cases of abscess, should be made by a knife or lancet, unless in some particular cases when the destruction of some glandular part is necessary; and in these we may employ caustic. The lancet employed in making the incision ought to be pushed in till the matter appears, and the cut made large enough both ways to allow the matter to be freely evacuated. It is, however, highly improper to stuff the cavity with doffils of lint, as is frequently done; for these always irritate the parts, and do much mischief. Indeed, such has been the absurdity of some practitioners, that the very circumstance occasioned by the introduction of their doffils, has been used as an argument that caustic is preferable to the knife for opening abscesses of this kind. It has been urged, that the cavity made by caustic is almost entirely filled up by the time that the eschar has separated, while that made by the knife remains open for a long time. But this happens only from the unskilful use of the knife, or rather from the bad management of the dressing of the wound afterwards; for, if the opening by the knife were to be cautiously treated with light dressings, without cramming it with doffils, as is too frequently done, there is no doubt that it

would be healed up as soon as the other ; with this advantage, that there would be no loss of substance, as there always must be when caustic is used. The only dressings indeed necessary, when a fistula in ano is opened, are pledgets of soft lint, spread with some emollient ointment, keeping a poultice constantly over the whole. Thus, in a short time, the hardness, which in this, as well as in other abscesses, affects the neighbouring parts, will gradually disappear, and the fore will heal with the same ease as in other parts of the body.

This is the most simple case of a fistula ; but it is not often that the surgeon's assistance is desired till matters are in a much worse state than that above described. It very frequently happens, that, where the abscess has been considerable, though the rectum be not corroded by the matter, yet it is laid bare in such a manner, that no cure can be effected without dividing the intestine. The like may happen, where the abscess has not originally been very large, but the matter by being too long pent up, and not having at last a free vent, has insinuated itself into the cellular membrane, in such a manner as to denude the intestine, and form a number of sinuses running in various directions. In this last case, the direction of the sinuses must be carefully examined ; and this may be easily  
done,



done, excepting where they happen to run in the direction of the intestine. When a sinus runs in this direction, it is proper to introduce the finger, well oiled, into the rectum, while the probe is introduced into the external wound; and thus we can not only discover if there be any communication between the cavity of the gut and the sinus, but likewise protect the intestine from any danger of being injured by the probe. It requires some dexterity indeed to pass the probe from the cavity of the sinus into that of the intestine; but a proper degree of attention will always accomplish it without injuring the rectum at all.

To discover whether or not there be any communication between the cavity of the intestine and sinus, we must observe whether any faeces be ever discharged from the wound, or air through it; or, if this should not be the case, we may inject warm water by the sinus, and observe whether any of it then passes through the anus. Thus we may for the most part know whether there be any perforation of the intestine; though indeed there may be cases in which we cannot know, with certainty, whether there is any perforation or not; but, in all cases where the intestine is much denuded, there is a necessity for making an incision through the gut itself, so that the cavity of the sinus may join with  
that

that of the intestine. The reason of this is, that, by so doing, the fistula is, as much as possible, brought into the state of a simple wound, whereas, if left in its native state, it will be impracticable to compress the sides of the sinus in such a manner as to make them unite properly; and the matter collecting in the bottom will constantly add to the injury of the intestine, and thus the disease will become worse and worse. When matters happen to be in this situation, it would be proper to perform the operation at the same time that the abscess is laid open, if the matter has penetrated to any great depth along the side of the rectum, as the additional pain will be but little; the patient is at once freed from the apprehension of any future sufferings, and the cure goes on from the first moment; whereas, in the other way, it cannot be said to commence till the incision is fairly made into the intestine. It will be proper to prepare the patient for this operation, by giving a laxative a day or two before, and a glyster the same day that it is performed. The most proper instrument is the probe-pointed bistoury represented Plate 1. Fig. 3. 4. 5. The patient may be laid on a table, with his legs kept asunder by assistants, or he may be allowed to stand with his back to a window, and leaning forward on a chair or table, so that the parts may be sufficiently

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ly exposed to view ; but, in this posture also, he must be well secured by assistants, which is more difficult to be done than in the other. The operator then must introduce into the anus the forefinger, previously dipped in oil, as far as it will go, and entering the bistoury at the external opening of the sinus, runs it along the course of the fore upon the finger, till he feels the point of it through the perforation of the intestine, and then pushing it through this opening, he cuts both the intestine, and surrounding parts, from the farthest extremity of the sinus, by dividing the gut through its whole length. This is done by turning out the point of the knife into the cavity of the rectum, while he pulls it along with the forefinger of the left hand, and the handle with his right. In this way the gut and sinus are completely opened, so that he may be certain there is no possibility of any matter forming a lodgement there. Every other sinus is to be treated in the same manner ; but it rarely happens, though there may be several sinuses, that there is more than one opening into the intestine ; for, when we lay open the largest sinus, all the rest are, for the most part, found to communicate with it, and not with the cavity of the rectum.

The perforation of the intestine is generally found to be at the upper extremity of the sinus ; and it is always a matter of importance to find out

out this, if possible ; because, unless a thorough communication be made between the cavity of the sinus, and that of the intestine, another incision would be necessary, as little expectation could otherwise be had of completing a cure ; for, in such a case, the parts could not readily adhere, and the *fæculent* matter would still have access to the cellular membrane, and thus continually give rise to new inflammations and erosions of the parts. When no communication between the intestine and sinus can be discovered, you must introduce the bistoury into the farthest extremity of the latter, and then pushing the point of the instrument through the intestine, upon the point of the forefinger, draw it along as before directed till it reaches the anus, so that a full division of the sinus may take place from one end to the other. Thus, indeed, the sphincter ani will always be divided ; but the inconvenience hence arising is not to be dreaded ; for, though the patient, for a short time, may be unable to retain his excrements, yet the power of retention always returns when the sphincter heals, which commonly happens soon after the operation.

It has been supposed, that, in the mode of operating just now recommended, the surgeon will be in considerable danger of wounding his own finger when he penetrates the rectum with the bistoury ;

bistoury; and to prevent this, some have been at great pains to invent instruments, by which this danger might be avoided. But, in using any other instrument than the bistoury, or some one similar to it, the danger is so great of wounding the bladder, or other important viscus, that we cannot hesitate a moment which to prefer. Besides the danger to the operator is merely imaginary; for, as the rectum is pierced with so much ease, by the small probe point of the bistoury, the finger is never in the smallest danger of being hurt by it. Neither is there any danger of laying open all the sinuses freely by incision, though some practitioners have imagined that terrible and even fatal hæmorrhages might ensue, if the hæmorrhoidal arteries or veins were cut, especially if the patient happen to have the piles, so that the veins are in a varicose state. So strongly indeed have their minds been impressed with this idea, that they have contrived a method of laying open a fistula, by means of a ligature. To perform this untoward operation, they introduce a piece of flexible silver or lead into the sinus, pushing the end of it through the perforation in the rectum, then doubling and drawing it out through the anus, after which the two ends are to be twisted together, so that the parts intercepted in the fold of the metal may be strongly compressed, and at last totally divided.

ed. But the mere description of such a method seems sufficient to prevent any one from making use of it. The tediousness, the pain it gives to the patient, and its inutility in preventing what it is intended for, are too evident to need any proof by argument ; besides, that the danger of any hæmorrhage of consequence is merely imaginary, and experience has shown, that, even where the incisions have been made with great freedom and boldness, the loss of blood has been very trifling.

It is obvious, from the whole of the above detail, that there is no possibility, in the manner of operating we have recommended, of laying open the sinus entirely, should the perforation of the gut happen to be farther up than the finger can reach. It seldom happens, however, that this is the case ; though sometimes indeed there are patients who have had sinuses running up to the very top of the os sacrum, or across, between the rectum and the bladder. In these unfortunate cases, all that the surgeon can do, is to lay open the sinus as far as his finger can serve for a director, but no farther ; and thus the patient will always find relief, by the more free and easy discharge of matter, if not a complete cure. The danger of making incisions farther up the intestine is so great, that the advantages  
resulting



resulting from them can never be a recommendation to the practice.

On the dressing of the wound after the operation for a fistula, as we have already observed, the certainty and facility of the cure in a great measure depends. One of the most common consequences of bad management in this respect is a diarrhœa, or tenesmus ; though sometimes these may be occasioned by the mere opening of the sinuses. When unskilful dressing is the cause, they are owing to the irritating nature of the dressings ; and even dry lint, which is much used by practitioners at present, appears to be by far too irritating for the tender parts laid open in the operation for a fistula. Instead of this we ought to use pledgets spread with some soft ointment ; such as a mixture of wax and oil, or what is still better moistened in fine oil only, though the fore must not by any means be stuffed even with dressings of this kind ; they ought only to be laid gently between the edges of it to the bottom. A compress of linen, with a T bandage, is to be put over the whole, and the dressings renewed once in the twenty-four hours, or after every stool, if it happens more frequently.

At every time the wound is dressed, it will be necessary to remove very carefully any fæces that may happen to stick about the edges ; but we must by no means use those detergent injections, which some writers recommend for cleansing

the fores, as their hot and irritating nature renders them as much to be dreaded, as the dressings already complained of. The wound generally heals up kindly, and cicatrizes as in any other part of the body; though sometimes it happens otherwise. In this case the matter becomes thin, foetid, and acrid, and the fore looks flabby, and becomes soft to the touch. Such appearances generally proceed from a previous bad habit, or an infection with the lues venerea; and, when this happens to be the case, every method must be used to remove that distemper, before we can hope for a cure. Indeed every method for this purpose ought to be tried previous to the operation, though sometimes a complete cure cannot be waited for. Sometimes indeed these symptoms may be occasioned by mere debility; in which case, tonic medicines ought be given, along with a nourishing diet, and the free use of wine. Issues, in some part of the body, are frequently of great use in this disease, especially when connected with any previous bad habit; and, when these are employed, it will be proper to proportion, as well as we can, the size of the issue to the discharge of matter from the ulcer.

By proceeding in the manner directed, there is great reason to hope for a cure in any case of fistula where the soft parts only are affected, or where the matter has not had time to commit  
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very great devastations. But if, by long confinement, it happens to have acquired a great degree of virulence, it will often be found to spread in such a manner as almost to baffle the art of the most expert surgeons. Such cases indeed are not very common; but instances do sometimes occur, where the under part of the rectum is entirely detached from the cellular substance naturally connected with it, as well as the common integuments from the subjacent muscles. In this situation, it has been recommended to give a very free exit to the matter, by removing a large portion of the integuments, or to take away the whole inferior part of the rectum, as far as a separation between it and the muscles is found to have taken place. Both these operations, however, are evidently of a very dangerous kind; and happily the milder method of simple incision is found, even in these seemingly desperate cases, to be productive of as good consequences as though the patient had submitted to them. The only thing therefore necessary to be done, is to lay open that part of the gut which is found separated, from one end to the other, which in most cases will allow the intestine to clap close to the sides of the sinus; and in this case an adhesion will soon take place; or it may be again slit open the length of the sinus on the opposite side, which will always be sufficient, provided

provided the bones and soft parts in the neighbourhood are not affected.

Sometimes these very large collections of matter, instead of separating the intestine from the surrounding parts, insinuate themselves between the skin and muscles of the perinæum or hips. When this happens to be the case, the tumors which contain the matter ought to be fairly laid open from one end to the other; and, if one incision is not sufficient to give vent to it, we ought not to hesitate at making another, taking care always to manage incisions in such a manner that the parts can easily be brought into contact with each other, that so a perfect adhesion may take place. In all these cases, the dressings ought to be applied as formerly directed; viz. gently laid on the edges of the wound to the bottom, without being crammed in or stuffed into it. Their nature ought also to be quite mild, without any ingredient which may in the least irritate or stimulate; for all irritations of parts laid open near the rectum tend to make the intestines discharge their contents, and thus bring on those troublesome symptoms of diarrhœa and tenesmus already taken notice of.

Though, for the most part, it happens that the matter of a fistula in ano is discharged in part by some external opening, yet that is not always the case. In what is called the occult fistula, the

the matter is discharged by the anus, either by itself, or mixed with the fæces. In this kind of fistula, there is some difficulty in properly making a distinction betwixt it and ulcers or impostumes of the superior parts of the alimentary canal; for in these also the matter is discharged by the anus. But it must be observed, that, in such impostumes, the matter, by reason of its long passage, appears intimately mixed with the fæces, by the time it is discharged by stool; while, in the occult fistula, it is either discharged unmixed, or only covers the outside of the fæces, which appear totally distinct from it. Add to this, that, in the occult fistula, though there be no external opening, yet there is always some kind of pain, induration, or discoloration, in the neighbourhood of the anus, which indicates the nature of the distemper. By those last symptoms, the seat of the disease may generally be discovered; for, where there is any discoloration, we are sure that matter is lodged within; and, even though there should not be any discoloured part, yet where matter is lodged, the patient will always feel pain upon pressing the part externally. When this is ascertained, the plain indication must be, to make an opening in that part where the matter lies, and then to proceed exactly in the manner already directed. The incision is to be made with a  
lancet

lancet or scalpel, which, as in the former case, is to be pushed in till the matter begins to appear ; for, in this kind of fistula also, there will always be some part of the pus lodged in the cavity of the sinus. The fore is to be treated equally in the same manner as though the fistula had been originally complete.

The more complicated and difficult cases of the fistula are those, in which by long neglect, or improper management, the parts adjacent to the sinuses become callous after a tedious course of inflammation attended with severe pain. Here also the remedy is the very same, viz. free incisions along the course of every sinus that can be discovered. It hath by some, indeed, been supposed that the callosities in question can only be removed by extirpating the parts, or destroying them by caustics, or escharotic remedies ; but experience has now abundantly shown, that they proceed only from matter pent up in the cavities, and that, when this is allowed to have a free vent, they soon go off. By others it has been supposed, that the callosities and indurations frequent in a neglected fistula, are of a schirrous nature, and to be removed by mercurials ; but schirrosities take place only in glands ; whereas the indurations we speak of are confined to the cellular substance, and always to be removed by the means already mentioned.

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Sometimes, indeed, where the sinuses are not very numerous, it will not be sufficient barely to lay them open, but there must be incisions made along the surface of the indurated parts, which, if the hardness reaches to any considerable thickness, must be persevered in for a very considerable time, that the fomentation of pus may be plentifully promoted on their surface, and thus the indurations, as it were, dissolved away.

Where it can be done, the discharge of pus ought to be promoted from the incisions first made ; or, if they heal up too soon, others must be made to supply their place. Sometimes, however, generally in such patients as are of a bad habit of body, the incisions, instead of suppurating kindly, and producing plenty of mild pus, inflame and discharge a thin foetid matter, with considerable pain. These symptoms generally proceed from some constitutional taint, not unfrequently of the venereal kind ; and here we must remove the primary disorder, before any radical cure of the fistula can be expected ; but, if the unfavourable symptoms proceed, as they sometimes do, merely from irritation, they may be removed by the application of warm poultices, which are not only very efficacious in removing irritation, but likewise in promoting the formation of laudable pus.

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We have only now to consider that species of fistula, in which not only the adjacent soft parts, but even the bones themselves are affected. In many cases, however, these violent affections are not the consequences, but the causes of fistula. A caries of some of the lumbar vertebræ may occasion suppurations in the adjacent muscles, and the matter formed by them, may fall down upon some part near the anus, and thus occasion a fistula; or it may be occasioned by bruises, or other accidents. At any rate, however, in these cases, the art of surgery can give very little aid. All that can be done is to give proper vent to the matter, to clean the sores, extract the pieces of loose bone, and support the patient's constitution by proper medicines and regimen. Thus a cure has sometimes, though very rarely, been accomplished; the pieces of carious bone having been exfoliated, and the wounds perfectly healed; though, in far the greatest number of cases of this kind, all that can be done is merely to palliate the symptoms. The worst case of all is, when there is a passage from the rectum into the bladder; which for the most part is occasioned by an improper management of ulcers about those parts. Thus, a passage is formed for the fæces into the bladder, and the most miserable distress is brought on, for which there is no cure. Sometimes those  
who



who are affected in this dreadful manner will live two years in misery, though more are cut off in twelve or eighteen months. The disease is known by a thick and disagreeably smelling sediment in the the urine, of a dark brown colour. This grows gradually more offensive, and approaching to the smell of fæces, while obstructions are at last formed to the passage of the urine; and both before and after any is voided, there are considerable discharges of air by the urethra.

The method of curing the fistula, in short, which I would recommend in every case, is, in the first place, to treat it as a local inflammation, which may or may not end in suppuration. If it can be resolved, we ought undoubtedly to do so; as thus the patient is freed from all the pain and trouble which must attend the operation; and in many cases this is certainly practicable; though unhappily it too frequently happens that the patient has neglected his disorder, not only till it is too late to prevent the suppuration, but till an abscess has formed, broke of itself, and formed many troublesome sinuses. In such cases it becomes necessary to follow the methods above directed; remembering only, that, if the disease happens to be a consequence of the lues venerea, it is absolutely necessary, if at all possible, to cure that distemper before any operation

is performed. If the patient happens to be scrophulous, we can only exhibit such medicines as are found to palliate that distemper, which the art of surgery as well as medicine is unable to cure. The following cases will exemplify and confirm the mode of operation above recommended.

J. H. a man of 30 years of age, who had I.  
formerly laboured under a fistula, for which he had been twice cut, gave me the following account. Having been engaged in hard labour during a very warm day, he sat down upon the ground, which was somewhat wet; after which he felt a little chilly and uneasy. Next morning he felt a kind of heat about the anus, on the left side of which a small tumor, about the size of a bean, had grown during the interval. Of this he took no notice for some days, until it became extremely painful, hard, and very considerably enlarged in size, extending along the left hip. He now took a dose of salts, and applied a poultice to the tumor, which soon after broke, and discharged a considerable quantity of matter. By this he was greatly relieved; however, he continued his poultice for some days longer, by which the hardness was almost entirely removed; so that finding himself now capable of work, he returned to it, but soon felt that

that his cure was far from being complete. The discharge, instead of abating, continued daily to increase, becoming more and more acrid, until at last it excoriated the whole inside of the buttocks, weakening him at the same time to a great degree. After three months he applied to a surgeon, who informed him of the nature of his distemper, and told him that it might be cured immediately. On his application to me I found him very much weakened and emaciated. On examining the cuts formerly made, I found that one of the sinuses had penetrated from the verge of the anus, along the left buttock, for about two inches and an half; the other extended from the point of the coccyx along the left side of the anus, extending nearly to the extremity of the other, and passing a little within the verge. The former had been dressed from the bottom, and was completely healed; the other was also healed; but there was a great discharge from the anus, and a very considerable quantity of matter flowed out, upon placing him upon a table, and opening his buttocks to view the seat of the disorder. Upon introducing the finger in ano, and a probe into the sinus, no opening into the rectum could be discovered, though the probe passed near three inches along the side of it. Upon introducing my finger, there was again a great flow of matter; which seemed to be of a  
very

very good quality. I gave him a gentle cathartic, and, two days after, performed the operation upon him, having previously emptied the rectum by an injection. The probe pointed bistoury was introduced to the very bottom of the fore; which being done, I penetrated the gut with the point, pressing it thro' upon my finger; then pushing the knife a little farther into the gut, I brought it down quite to the extremity of the sinus, laying it quite open from one end to the other. But, on examining the sinus, before the patient was dressed, I found the whole posterior part of the rectum separated from the surrounding parts, to the very verge of the anus; on which I introduced a probe, bent in such a manner as to pass through the whole sinus to the opposite part of the anus, and made the point press on the verge so as to serve for a directory to make an opening with a lancet; and upon this I again introduced the bistoury to the bottom, and laid the whole open in the same way. A little cadice, dipped in fine oil, was then put between the lips of each opening, and a compress applied in the manner already directed. After giving an anodyne, the patient was put to bed, and the dressings were renewed in thirty-six hours; he had little pain, and his pulse was only 80 in a minute. The wounds were regularly dressed every twelve hours; and, in 24 days from the operation,

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tion, seemed to be completely filled up, his appetite and strength restored; he went to the country, and never had the least return of the disease since that time.

In this case, it was evident that the surgeon, who operated upon him before, had supposed the sinuses to be merely superficial, for which reason he had not searched for an opening farther than the external verge of the anus, the opening here, being within it about the eighth of an inch; but the consequences show how important a matter it is to be assured that no sinus is left unopened as otherwise the disease can never be radically cured; and though the patient may for a time be relieved, yet it will soon manifest itself with worse symptoms than before.

Since the above patient was cured, I had occasion to operate upon another exactly in the same circumstances. The whole posterior part of the rectum was separated from the surrounding parts to the very verge of the anus; the distemper had continued for twelve months, and the discharge of matter was very great; the patient had a hectic appearance, and was much emaciated with cough, partial sweats, and quick pulse. The operation was performed in the same manner as in the last case; both sides of the rectum being laid open for three inches, and the dressings applied as already mentioned. An  
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anodyne was given after the operation; and while the wound was healing, he was confined chiefly to a milk and vegetable diet; with an anodyne every night to lay the cough; the bowels being kept open by a mixture of 'ol. Ricini and brandy. The discharge of matter was much diminished by the end of the first week; healthy granulations began to appear in the wound which was dressed regularly twice in the 24 hours, and, in four weeks from the operation he was able to go to the country; perfectly free of his fistula, as well as cough, and sweating, though weak. In June last I heard from him, when he was perfectly well.

A. M. after a long and severe journey on horseback, was attacked with coldness and shivering, succeeded by heat, and other symptoms of fever. In 36 hours after the attack, he felt a pain at the anus, attended with considerable hardness and swelling. For this he applied six leeches, encouraging the bleeding by a warm poultice, and afterwards took a gentle laxative. Notwithstanding these remedies, however, the swelling continued to increase, till it became of the size of a goose's egg, attended with severe pain, and the other febrile symptoms not at all diminished. In ten days from the first attack, he began to void matter by stool; which relieved

ed the pain and febrile symptoms considerably. In this way he continued for six months; the matter constantly flowing, but without any pain. When he applied to me at the six months end, he complained of some degree of tenesmus, with constant pain about the root of the penis, particularly on the right side; besides discharging matter with every stool, which he had at least four times a day; so that he was now become much emaciated and very weak. Finding, however, that he had formerly been healthy, I determined to perform the operation without delay, and therefore ordered him an injection next morning, to clear out the rectum previous to it. On examining the anus, I observed some remains of the old tumor, with a little softness near the verge of the anus, into which thrusting a lancet about half an inch deep, there was a discharge of about two ounces of matter. I then introduced a probe to the very bottom of the abscess, and having oiled my fore-finger, introduced it into the anus and felt for the probe, which having found with a little care, I pushed it into the gut. After withdrawing the probe without removing my finger, I entered the bistoury, to the bottom of the sinus where its point easily passed through the opening of the gut upon the finger; and, by turning it properly, the whole of the sinus, though near three inches long,

long, was laid open. The wound was dressed with caddice dipped in fine oil, and introduced between the edges ; but as his belly was so loose, it was found necessary to renew the dressings four times a day. He had an anodyne draught on being put to bed, and the same was repeated every night. For breakfast he was allowed boiled milk poured upon toasted bread, with sugar ; chicken broth for dinner, and boiled rice and milk for supper. In 14 days from the operation, the discharge was greatly lessened, the wound looked well, his appetite much mended, and his pulse, which, before the operation was 108, now was reduced to 80. Animal food, with a little wine was now allowed, and in 14 days more, he went into the country perfectly cured.

J. M'D. a man of 40 years of age was put under my care, for a fistula of no less than eight years standing. It began originally like a common phlegmon, and had been open for four years, apparently without hurting his health. When I saw him, he had a large hard tumor upon the right hip, near the tuberosity of the ischium, where he complained occasionally of sharp shooting pains. At the upper and under edges of this tumor were two large callous excrescences, with a fistulous opening in each, meeting



meeting in the centre of the tumor, and discharging a great quantity of thin fætid matter. After cleansing the bowels with a dose of senna and tamarinds, and a laxative injection, I laid open both sinuses ; but, on examining the centre of the tumor where they met, I found another running up the side of the rectum for the space of four inches, but not communicating with it. This was also laid open in the manner already described ; after which I introduced a piece of caddice dipped in fine oil between the lips of the wound, pushing it down to the bottom. The patient had a draught with 40 drops of laudanum, but as he lost a considerable quantity of blood during the night-time, it was found necessary to renew the dressings frequently. In about a week after the operation he was attacked with a severe diarrhœa, for which he had half an ounce of a mixture made with two drachms of the confectio japon. dissolved in two ounces of cinnamon water, to which was added three ounces of common water, and half an ounce of syrup of violets, with 100 drops of laudanum. This, dose viz. half an ounce of the mixture, was to be given after every loose stool, and by the use of it he got clear of his diarrhœa in five days. As there was still a considerable degree of hardness round the wounded parts, attended with much pain, I ordered a large e-

mollient poultice to be applied to the parts, and renewed twice a day. In six weeks from the operation the hardness was totally gone off, and the wound skinned over. He has continued in good health ever since.

K. P. a young man of 22 years of age, V. had an inflammatory swelling near the anus, which succeeded a fall. It continued for 18 months without bursting, after which a small opening broke out, and discharged a considerable quantity of thin acrid matter; the sinus from which it proceeded running up along side the rectum, to the edge of the sacrum, but without any perforation of the intestine. In this situation matters had continued for eight months before I saw him. On examining the parts, I ordered a dose of the compound powder of jalap, which operated twice; and next day I performed the operation, by introducing to the bottom of the sinus one of my largest probe pointed bistouries, and, pushing it through the gut, as directed, upon the point of my finger, I laid open the whole with great ease and quickness. He was dressed in the usual manner, had a draught with 40 drops of laudanum; and, being a robust man, was kept on a very slender diet. For about a week after the operation, things went on well; but after that time he was attack-  
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ed with febrile symptoms. His tongue being white and parched, I ordered him a mixture with five grains of tartar emetic to four ounces of water, a table spoonful to be taken every fifteen minutes till it operated. The febrile symptoms, however, still continued, and he was constive; for which reason I ordered a saline julap of eight ounces, with two grains of tartar emetic; a table spoonful to be taken every hour, until he should either vomit, purge, or sweat. This brought on a profuse sweat in the night-time, and next morning the febrile symptoms were gone; but the wound was painful, the matter discharged from it red, and the edges inflamed and swelled, particularly about the sphincter ani. An emollient poultice was put over the dressings, and the julap continued without the tartar emetic. Thus all the bad symptoms disappeared, and the cure was complete in a month from the operation.

J. W. 30 years of age, by trade a currier, VI. had a large inflammatory swelling near the anus, which he allowed to come to suppuration before he applied to me. When I first saw him there was an opening near the left side of the anus, from which was a considerable discharge of very fætid matter. No fæces were passed through the wound, nor had he ever observed  
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any wind discharged in this way. On examining the parts, I easily introduced a probe about two inches alongst the left side of the gut; the man was perfectly sensible of the nature of his distemper, and willing to undergo any operation I chose; considering therefore that his labour was necessary for his daily subsistence, and having heard much of the advantages attending the operation by ligature, I determined to perform it upon this patient, in hopes that he might, during the time of the cure, be able to go about his usual occupation. This was accordingly done, by introducing a small canula through the the opening upwards to the bottom of the sinus, penetrating the gut with a sharp pointed filette through it. The filette was withdrawn, and a lead probe, the size of the canula, was passed into the rectum, and laid hold of and brought out by a pair of forceps for the purpose, the two ends of which were now hanging out externally. A little solid cylinder of silver, about half an inch long, with two holes in it to admit the wire, was now made use of to twist it close up to the anus, so that the patient felt some pain, after which the twisting was intermitted, and the wire tightened only every third day. All this was performed with the utmost care and caution; yet, instead of being able to go to work, I found my patient could not get out of bed, except to have

it made, for ten days after the operation ; and every time that the lead was tightened, he complained so much for twelve hours, that it was found necessary to have recourse to laudanum to alleviate the pain. In fourteen days from the operation, indeed, the fistula was laid open ; but after it was so, no other advantage attended it, than would have attended the operation in the common way, the wound requiring the same dressing as if I had used the bistoury, the cure requiring four weeks to complete it, in which time it would have been done, had the knife been used.

Thus it appeared that the method of curing a fistula by ligature is by no means eligible, which indeed might have been known *a priori* ; for, in operating by ligature, it must be considered that we have four instruments to make use of, viz. a canula, a stilette, (to perforate the gut, if there happens to be no natural perforation), a pair of forceps, and a piece of lead wire. Having but two hands, in one of which is the canula, and in the other the forceps, how are you to introduce the stilette ? No doubt this may be done by an assistant ; but this single circumstance shows how much inferior the mode of operating by ligature is to that by the knife, where the surgeon, without having recourse to any third person,

person, can go through the whole process in a very short time. The length of time also required for completing the opening is surely very much to be regarded; and there is scarce any patient who would not at once endure a sharp pain for a few minutes, to be freed almost ever after of suffering any more till the cure was performed, rather than one somewhat less, for the chance of recovering in a fortnight, but put to the same pain every second day during the time. My patient indeed had no particular complaint, except from the inconvenience and rubbing of the wire between his buttocks, unless at the time that the wire was tightened; but the total inability to sit or walk for so long a time must undoubtedly be accounted sufficient punishment, and much more than any humane practitioner would wish his patient to suffer. Not satisfied, however, with this single instance, I operated in the same way upon another, where the fistula, though it penetrated only an inch up the side of the rectum, had remained open fortwelve months. The event was the same as before; for, on tightening the wire, he complained as much as he would have done had the operation been performed by the bistoury; and as this tightening had to be thrice performed, it was, in my opinion, submitting to as many different operations. He was unable to go abroad till three weeks after

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ter the operation, and the wound required dressing every day for 14 days longer.

J. M. a man of 36 years of age, applied  
to me for a large hard swelling which ex- VI.  
tended from the middle of the perinæum, on  
the right side, along the right hip, to the part  
where the point of the coccyx is extended over  
it. There were four openings in it; one near  
the middle of the perinæum, another on the  
right side of the point of the coccyx; a third on  
the outside of the buttock; about four inches  
from the anus, nearly at right angles with the  
other two. The first run upwards to the space  
betwixt the anus and tuberosity of the ischium;  
the second penetrated downwards to the place  
where the former seemed to terminate; and the  
third seemed to terminate at the verge of the  
anus, along with the other two. The disease  
came on with phlegmon, or phyma; and this  
originated from hard riding and cold. It first  
broke in the very centre of the swelling, which  
was so large as to cover the whole hip, and con-  
tinued for fourteen days to discharge matter  
very freely from this opening, with a diminution  
of the swelling, pain, and other disagreeable  
symptoms; though no inconsiderable degree  
both of swelling and hardness continued. This  
opening healed up, and has continued so ever  
since;

since; but the pain and tension returning towards the perinæum, an opening broke out here. Some weeks after, another took place upon the outside of the hip, and in a fortnight more that on the verge made its appearance. At the time I saw him they had all been open for three years and an half; the hardness constantly increasing, and the matter becoming thin and acrid, and discharged in such quantity, that his health was very much impaired; he had frequent attacks of diarrhœa with tenesmus, but without any appearance of matter in his stools; his appetite was impaired, and his pulse about 100. I operated upon him, by laying open all the sinuses to the common centre where they met, and where the edges were at least an inch and a quarter thick, and very callous. On examining this centre, I found another sinus running up by the side of the rectum for nearly three inches and an half, which I also laid open to the very bottom. The wounds were slightly dressed, and the patient, having got an anodyne, was put to bed. Two days after the operation, an inflammation, pain, and swelling came on; but those symptoms abated on the application of a large poultice, the use of anodynes, and the bark. A nourishing diet, with a moderate use of cordial liquors, was allowed; and in two months from the operation  
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the wounds were completely healed without any bad symptom.

## CHAP. VI.

*OF A PROLAPSUS ANI.*

THIS disorder (consisting in a protrusion of part of the rectum) is always owing to a debility of the sphincter ani, and parts in its neighbourhood, which serve to support that intestine, and keep it in its place. The prolapsus may be occasioned by violent strainings to stool, and thus is frequently brought on by the use of aloetic or other strong and irritating purgative medicines; by the irritation of the worms called ascarides; by the natural straining of such as are troubled with habitual costiveness, or by any other cause which stimulates the rectum very much to evacuate its contents. It is not generally fatal, though frequently very troublesome. In the Medical Essays, indeed, we have one instance of a child dying of a prolapsus, but then the intestine was found to be perforated, so that we must account this a fistula rather than a prolapsus, or a complication of the two together. The rectum, indeed, is capable of bearing exposure to the air for a much longer time than any other part of the alimentary canal; and hence

the prolapsus is not commonly dangerous, though it has been of very considerable duration ; yet it never can be accounted prudent to let the intestine remain for any great length of time unreduced, where it can be done. No preparation is necessary for the reduction ; it ought to be attempted as soon as ever the surgeon is called. The patient, being put to bed, is to lie upon his face, with the buttocks elevated ; and the surgeon ought to press upon the protruded part of the intestine equally, but with considerable strength, with the palm of his hand. This will generally prove sufficient ; but, should it not, he must press up the higher part of the gut with the fingers of one hand, while the palm of the other supports the inferior part ; and this will never fail to prove successful, unless the gut happens to be inflamed and swelled by long exposure to the air. When this is the case, venesection may be used according to the strength and constitution of the patient ; and such applications to the gut itself will be necessary as are found to be useful in allaying inflammations in other parts of the body ; one of the best of which probably is a weak solution of saccharum saturni moderately warmed. After the inflammation is abated, the intestine may be reduced with ease ; but it is frequently a matter of no small difficulty to retain it in its proper place, on account of the debility of the sphincter ani,

ani, which was indeed the original cause of the disease, and by long continuance is now rendered in a manner habitual, so that its tone can scarcely be restored. Thus, though the gut may remain in its proper situation, while the patient lies in bed, or remains in a sitting posture, yet, where the debility of the sphincter and parts adjacent is very great, it is apt to be protruded upon every attempt to go to stool, or even when the patient walks, or stands upright for any considerable time. In this case, there is a necessity for the application of a proper bandage or truss, such as represented Plate 2. Fig. 1. by which the parts may be preserved in their natural position; and, if the intestine should happen to protrude upon the patient's going to stool, they may be immediately replaced, which can be done by the patient himself.

As debility is the evident cause of this disease, so the cure is promoted by the use of tonic medicines, as the bark, steel, and the application of cold water to the parts in the vicinity of the anus, or small doses of the pulvis stypticus, from five to ten grains, given four times a day. It will likewise be found very useful to inject astringent liquids, as decoctions of galls, oak bark, and other vegetable matters of that kind; for, as the disease originally proceeds from a debility of these parts, the injections just mentioned

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ed serve to remove that debility, especially when a little opium is added to take off the irritation.

## CHAP. VII.

*OF AN IMPERFORATED ANUS.*

THIS is sometimes found to be the case with new born infants ; and, unless very speedily remedied, must occasion their death. Sometimes the end of the rectum is distinguishable, though covered with skin and cellular substance ; but, in others, the skin is quite smooth or even, without any sign of the termination of the intestine between the scrotum and coccyx. In some cases, indeed, the rectum has been found to terminate, not in the usual place, nor near it, but in the bladder, vagina, or as high up as the top of the os sacrum.

In the most favourable cases, where the extremity of the intestine is only covered with skin and cellular substance, the fæces, protruded by the peristaltic motion of the guts, form a protuberance at the place where the anus ought to be. The remedy then is obvious, viz. to open the protuberance, by means of a scalpel, and thus form a passage, which by due care may be kept open ever after. But, where there is no direction of  
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this kind, the surgeon is then to make an incision in the place where the anus usually is ; and, if it lies deep, he must continue the opening along the passage which the rectum is known usually to take, viz. back towards the coccyx, so that he may not be in danger of wounding the bladder, vagina, or any important part, which he would be apt to do, should the incision be directed more forward through the pelvis. The finger is here the best, and indeed the only director he can use; and making the fore-finger of the left hand serve for this purpose, he must dissect away the parts along it till he meets with the rectum, which will be known by the discharge of fæces. If this is not met with, the incision is to be continued the whole length of the finger, after which, the only chance of saving the child's life is to push a trocar up in the direction of the finger, till it perforates the intestine. The formation of an artificial anus ought always to be attempted, even where the gut terminates in the bladder or vagina.

In the former case, the necessity of the operation is evident ; for, if the rectum terminates in the bladder, all the excrements must be discharged into it, and a fatal suppression of urine very soon take place ; and, even if suffered to remain in the vagina, the greatest and most disagreeable inconveniencies must be the consequence.

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If, after all our endeavours, a free passage for the fæces cannot be procured, there is no doubt that the child must die. In such a desperate case, when it is better to try a doubtful remedy than none, it might perhaps be allowable to attempt an opening on the right side, or somewhere, in such a situation that the incision may reach the caput coli, and here forming an artificial anus; but, as this has never been attempted by any person, nothing farther can be said upon the subject than merely to suggest the possibility of its being done.

In this disease, even when we are attended with all the success that can be expected, it is very often found to be a matter of the utmost difficulty to keep the opening, that has once been made, from closing up entirely in a short time; and this inclination to heal up has generally been found proportionable to the depth of the cut. The least irritating materials are to be made use of for the purpose of keeping open the wounds; and these are dossils of lint moistened in oil, or rolls of soft bougie plaster. Sponge tent, gentianroot, and other hard substances have been found improper, on account of the pain they occasion. Indeed, however simple this part of the cure may seem, it has always been found a matter of great difficulty to keep the orifice open after it was made, as the best practitioners have acknowledged.

However,

However, in two cases of this kind that came under my care, when an opening of an inch and an half in depth was necessary, before the rectum could be laid fully open, so as to allow a free opening to the fæces, after the operation, an oval canula, such as represented Plate 1. Fig. 7. AA two pieces of tape to fix it before and behind to a circular bandage round the body; B a circular ring upon the end that is introduced into the gut, one tenth of an inch thick at the body of the instrument, but rounded off towards the extremity, so that it might pass into the gut easily; C the body of the instrument, which is to be covered with a piece of caddice moistened in fine oil, and rolled round it to the thickness of the ring B, this to be secured by a fine cotton thread. The instrument armed in this way was introduced. The fæces passed off through it, and once every twenty-four hours it was withdrawn to dress it afresh. In this way the cure went on, and was completed in two months; but the instrument was used for nine months after the whole of the parts were perfectly healed up, in order to prevent too great a degree of contraction. If it should be necessary to continue the use of the instrument for a longer period than nine months, one with an opening of three quarters of an inch, instead of  
half

half an inch, (which is the size of the one represented in the plate), may be used.

## CHAP. VIII.

*OF THE PARACENTESIS OF THE  
ABDOMEN.*

THIS operation becomes necessary, when any considerable quantity of aqueous fluid is collected in the cavity of the abdomen, and cannot be dispelled by any assistance of medicine. The paracentesis consists merely in letting it off, in order to give the patient some ease for the present moment; for it is seldom that it accomplishes a cure, or prolongs life. Sometimes it even proves unsuccessful for obtaining that end for which it is properly calculated; as, when the water is confined in cysts, forming hydatids, or when it is so thick and viscous, that it cannot flow out through the canula introduced for its passage. It is, however, attended with very little pain; and there are many instances of its having been performed a great number of times upon one patient, whose life has thus been prolonged for a considerable time. The operation ought therefore always to be performed, where



the patient is much distressed, and there is good reason to hope that the fluid is sufficiently thin to be evacuated. This may generally be known from a fluctuation in the belly when struck upon one side; the undulation being communicated to the fingers on the opposite side, and from the swelling being equally diffused over the whole abdomen. The signs of the operation being necessary, are an extreme oppression and difficulty of breathing, an inability to lie in an horizontal posture, great anxiety and want of rest, &c. When the swelling has the appearance just mentioned, there is reason to hope that the patient may be relieved; but not if it is unequal, without any perceptible fluctuation. Sometimes indeed, in females, a great quantity of water is collected in one or both the ovaria, in which case the fluid may likewise be drawn off with advantage to the patient, even though the tumor be less equal, and have less fluctuation than in other cases.

In dropsies, as in almost all other chirurgical cases, it will be proper to let the disease run on for as short a time as possible before the operation is performed; for the water being in immediate contact with the viscera, communicates to them a putrescent tendency, and not only to them but to the whole body, a gangrenous disposition, which continually increases; and hence

wounds in dropfical people heal with much more difficulty than in others, nay sometimes mortify from the flightest caufes. As foon therefore as internal remedies are found infufficient, recourfe ought to be had to the paracentefis ; and it is not without great probability that fome practitioners attribute the little fuccefs that attends the operation to its being fo often delayed beyond its due time.

In former times, the paracentefis was reckoned a very dangerous operation ; the patient being very liable to faintings after the water was drawn off, nay sometimes to fudden death. This was owing to the too quick removal of the preffure to which the viscera had been accuftomed ; and, as the fatal fymptoms arofe from this caufe, fo they were eafily removed by fubftituting an artificial preffure during the time that the water was drawing off, and for fome time after, inftead of that which had been produced by the water. The beft contrivance for making this preffure, is by a kind of belt invented by the late Dr Monro, and reprefented, Plate 2. Fig. 2. the ufe and manner of applying which are evident from infpection.

The proper inftrument for performing the paracentefis, is a trocar with a canula for letting off the water ; but, till of late, the beft form of it has not been determined. Formerly the trocar

car had a triangular point, the rest of it being of a cylindrical shape. By this it was found difficult to perforate the integuments, and a flat one was next tried, where the point of the trocar resembled that of a lancet. This was found to answer much better; but, as in this instrument the canula consisted of two parts which forcibly fell together when the stilette was withdrawn, there was danger of them catching a part of the intestine. The instrument represented Plate 2. Fig. 3. is not liable to this objection, and is amongst the best hitherto invented. Different sizes are there to be seen.

The most proper place for performing the paracentesis, is at about an equal distance between the umbilicus and spine of the ilium on the left side, where there are no large blood vessels, and the parts to be penetrated are rather fleshy than tendinous, and consequently not difficult to be healed. When it is to be performed, the patient ought to be laid in an horizontal posture, the part to be pierced, having been previously marked with ink; one of the openings of the bandage ought to be brought directly before this marked place, the straps somewhat tightened by means of the buckles, and the side to be perforated ought to be over the edge of the bed. The surgeon then is to push the trocar through the skin only, till the point of the stilette and a quarter of an inch of the  
canula

canula have passed below it, he is now to direct its point with his forefinger and push it through the muscles, until he is satisfied that the extremity of the canula has reached the water, so that it can flow out through it; and this he will always know, when no farther resistance is made to the instrument. When this is found to be the case, he must withdraw the stilette, and allow the water to flow out as long as it will, taking care always to pull the straps tighter and tighter as the water is discharged. Should the patient, however, happen to become faintish, the efflux of water may be stopped for a few minutes, by the surgeon putting his finger on the orifice of the canula. When all the water has run off, the wound may be dressed superficially with a pledget spread with any simple ointment, the bandage is still to be continued pretty tight, not only to prevent the faintness already mentioned, so dangerous to the patient, but likewise a return of the disorder, to which in some cases it is probable it may contribute; the strength of the patient is to be recruited with cordials and a nourishing diet, in order to corroborate the system, and thus take off the relaxation which originally induced the disease; but, as it is very seldom that this takes place, the only thing that can be done is to have recourse to the operation again, as soon as it appears to be necessary.

It is not uncommon, during the performance of this operation, for the water suddenly to stop long before the full quantity is drawn off. Sometimes this happens from a piece of intestine or omentum obstructing the canula, which may be removed by introducing a probe or other blunt instrument through the tube. If the water happens to be very viscid, the only thing we can do is to introduce a larger trocar ; but, when hydatids are the occasion, it is to no purpose to continue the operation in that place, though we may renew it on the opposite side, or in any other part where it seems likely that there is a collection of water.

In the case of a dropsy of the ovarium, we are to follow the same method ; only it is to be remembered that the fluid is not so distinctly perceived to fluctuate, and the swelling is commonly confined to one side of the abdomen, excepting when the disease of the ovarium is combined with an ascites, or when it is of such a size as to fill the whole abdomen, which frequently happens.

Sometimes, though rarely, the operation of paracentesis is necessary for giving vent to collections of air in the abdomen. Air, when pent up in this manner, is generally contained in the bowels, which it blows up to an enormous size. Instances, however, are related of quantities of  
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air being contained between the peritonæum and intestines ; but, in some of those, this air has been known to have escaped thro' a small hole in the intestine itself, and it is probable that all the rest were of the same kind. At any rate, when the symptoms become very urgent, there is as much necessity for the paracentesis in this disease, (called the *tympanites*, or tympany), as in the true dropfy. Neither are we to delay or omit the operation because we suppose the air to be contained in the intestines; for, by puncturing them, the patient has a chance for his life, which must undoubtedly be lost, if the disease be suffered to go on. The operation is to be performed as directed for the dropfy, and the patient to be treated exactly in the same manner. In this case, however, we must take care to employ a very small trocar, and use the same means for pressure on the patient's belly as already directed ; for, the smaller the wound is, so much the better, as the air can easily be expelled through a small as well as a great one, and the pressure on the intestines, from the distension of the integuments, is the same whether they be distended by air or water.

## CHAP. IX.

*PARACENTESIS OF THE THORAX.*

THE paracentesis of the thorax, though often equally necessary with that of the abdomen, is much less frequently performed. The necessity of it is apparent in many cases, where the respiration is much impeded by pus, serum, blood, or air extravasated into the cavity. The fluid most commonly met with in the cavity of the thorax is pus; and we know that it is deposited there, when an inflammation has previously taken place, which, instead of being quickly resolved and terminated, has continued for a long time, and brought on those symptoms which indicate suppuration in other parts of the body. Sometimes, indeed, in cases of this kind, the matter is expectorated in great quantities; but, in a great many more, the patient has a tickling cough, an oppressed respiration, cannot lie upon one side, nor has any inclination to lie down in any posture. He is likewise frequently attacked with slight rigors and shiverings, and sometimes the affected side is swelled, or has a kind of œdematous feel very different from that of the other.

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These symptoms may be accounted a certain indication of pus contained in the cavity of the thorax. A serous, or watery tumor here is frequently accompanied with dropsy in other parts of the body, and the signs of it are pretty much the same with those of pus; only we may conclude that the fluid is serous rather than purulent, from the absence of those pre-disposing causes already mentioned. Sometimes the patient, upon being hastily moved, will perceive a kind of undulation in his chest, and when the quantity is considerable, the undulation will even be heard by the by-standers if the patient be smartly shaken backwards and forwards. Sometimes, however, the water, instead of being contained in the cavity of the thorax is inclosed in the pericardium. The symptoms are much the same as in the other case, only, according to M. Senac, when much water happens to be contained in the pericardium, there is a firm undulatory motion perceptible, at every pulsation of the heart, between the third, fourth, and fifth ribs. There are instances, however, of the water being collected between the plates of the mediastinum. In this case, though the pain and oppression are equally great, they are felt more in the middle of the breast, but as the seat of the disorder is then directly under the sternum, the paracentesis cannot be performed in the same manner as  
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in other cases. When blood is collected in the thorax, the symptoms are still worse than those we have yet mentioned; for, in addition to the oppression and debility occasioned by collections of pus or serum, there is a very great feebleness and irregularity of the pulse, and all the other complaints are much more severe than when any other kind of fluid is collected. The reason of this is evident, because there can be no considerable collection of blood in this cavity, without a wound in some of the blood vessels, either by a foreign body, by the erosion of ulcers, or a rupture from violent efforts in coughing, &c.; Air occasions symptoms very little less alarming than those arising from an effusion of blood. It may be occasioned by wounds in the lungs; by a mortification of any internal part, for it is the nature of mortifications to produce an elastic vapour resembling air; by a rupture of the membrane of the lungs from violent coughing, &c. by the erosion of ulcers; or by the laceration of their membranes by the point of a fractured rib, or vertebra. The symptoms are the same, whatever be the cause, viz. a straitness of the breast, and oppression of the breathing, attended with pain, an inability to lie down; a flushing and swelling of the face; a feeble and irregular pulse; coldness of the extremities; all of which, gradually increasing, soon terminate in death, if the

patient is not suddenly relieved. Along with these symptoms there is always an emphysema of the chest, which sometimes extends itself in a surprising manner over the whole body; and so quick is the progress of the whole malady, that death has sometimes been known, in a few hours, to follow the fracture of a rib, by which the surface of the lungs had been slightly wounded.

In all cases where any kind of fluid happens to be extravasated into the cavity of the thorax, very little dependence can be had upon internal remedies; the paracentesis can only be had recourse to with any hope of success; but though this remedy is the same in all cases, there must of necessity be various modes of performing it. In collections of pus, we are frequently directed, by the pain which the patient feels, to the place which it is most proper to pierce; but where this is not the case, the most proper part for making the incision is between the seventh and eighth ribs. The patient is to be laid on the affected side, which must hang over the edge of the bed; the surgeon must make an incision with a scalpel, in the place above mentioned, about two inches long, in the direction of the ribs, and at an equal distance between the sternum and vertebræ of the back; though it is proper to observe that there is not any occasion for making the internal incision as  
large

large as that through the skin and cellular membrane; the latter, as has already been mentioned, ought to be about two inches long, but an inch will be sufficient for the internal perforation. The incision being continued down to the pleura, that membrane is to be laid bare; and we must then cautiously examine whether there are any adhesions betwixt it and the lungs. If there are, the place where such adhesion is must be avoided; because, otherwise, the lungs would be wounded, and the patient rendered worse than before; but by making a small incision through the pleura, where no adhesion takes place, the matter will be speedily evacuated, with great relief of all the symptoms.

Where the fluid contained in the thorax is of a serous nature, it will be proper to introduce a small silver canula into the wound, by which not only the evacuation of the water will be promoted, but the efflux can be more readily stopped, if the patient should become faint. As it may sometimes therefore be proper to delay the drawing off of part of the water, the canula should be so constructed, that, by means of a ribband tied about the body it can be preserved in its place; a pledget covered with emollient ointment ought to be laid upon the wound, and the whole covered with a proper bandage; the patient is to be  
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laid to rest, and the remainder drawn off as soon as it is supposed that his strength can bear it. This observation is particularly necessary where both sides of the thorax are filled with water. In this case there would be an evident impropriety in perforating both sides at the same time, because the air, having thus access to both lobes of the lungs at once, may produce as dangerous symptoms as were before produced by the water. In any case indeed there must be some danger from the admission of air into the cavity of the thorax ; for, whatever care we may take in the introduction of the canula, and keeping it in a proper position, some portion of air will undoubtedly insinuate itself ; and where the operation must be performed on both sides of the thorax, it is absolutely necessary to expel the adventitious air from one cavity before it be admitted to the other. To effect this in as great a degree as possible, the patient must fill his lungs with air as much as possible, which will expel a considerable quantity of that which has got in between the lungs and pleura ; after which the skin must be pulled down over the wound, and kept in this position ; and, by repeating this effort, almost the whole quantity of extraneous air will be expelled ; and the wound being covered with a proper bandage and compress, may be allowed to heal. The air may likewise be extracted

tracted by means of a syringe, or the application of the mouth of an elastic gum-bottle ; for by squeezing out the air from the latter, the elasticity of its sides, after the pressure is taken off, will tend to restore it to its former shape, while the air in the cavity of the thorax will rush in to keep up the equilibrium, and the bottle will perform the office of an air pump.

After the perforation has been made, and the fluid, whether pus or serum, drawn off, it will be proper, especially in the case of pus, to keep the wound open for some considerable time, that the noxious liquid may gradually be evacuated as fast as it is collected. For this purpose, it will not be necessary to keep the wound continually stuffed with tents or dressings, only now and then to introduce a piece of bougie, which may be allowed to remain there for a few hours at a time, when the wound appears likely to heal up. Or, instead of this, the small silver canula already mentioned may be made use of, until the internal abscess, or other source of the matter, be dried up. Thus there have been instances of people being perfectly restored to health, who must otherwise have inevitably perished ; and, even by allowing the sores to heal too soon, whatever relief may have been given originally by the operation, the patient will soon find himself oppressed as before by the collection of a fresh quantity

ty of matter, and there will be the same occasion for performing the paracentesis as before.

When blood unfortunately happens to be collected in the thorax, we must sometimes proceed in a manner different from what would be proper in other cases. If the extravasation takes place in consequence of a wound in the lower part of the cavity, there will be no occasion for making a new perforation; it will be sufficient to enlarge the wound a little, that the blood may be evacuated by it; though, if it be situated in the upper part, another perforation will always be necessary; because the fluid could not be evacuated unless there was an opening in a depending part of the thorax. When a rib happens to be fractured, or a blood vessel ruptured, it will then be proper to make the incision as near as possible to the part affected, so that not only the blood may be evacuated, but any loose portions of bone extracted by its means.

The greatest difficulty in the case of extravasated blood arises from the nature of the fluid itself; for, as the blood is of a very coagulable nature, it soon unites into such an hard mass, that it cannot be evacuated. In this case the most obvious method is to enlarge the wound as far as can be done with safety; and if, after all, we should not succeed, recourse must be had to injections with warm water, allowing the liquid to remain

remain for some time in the cavity, by which the mass may be gradually dissolved. When a blood vessel in the lungs themselves is ruptured, part of the blood is commonly discharged by the mouth, to the great relief of the patient; and while this discharge continues, it would be improper to perform any operation.

The discharge of air from the lungs into the cavity of the thorax is always attended, as we have already mentioned, with an emphysematous swelling of the chest, and frequently of the whole body. In this case the symptoms may frequently be very much relieved, by merely making punctures in the swelled part through the skin. The incisions may be about half an inch long, and deep enough to penetrate through the whole of the cellular substance. If this gives no relief, the paracentesis ought to be performed in the manner already directed; only, as in this case there is no liquid to be evacuated, the opening may always be made as near as possible to the part affected; and here we are almost infallibly certain of success; as the air, by its elasticity, instantly escapes in great quantity, as soon as the perforation is made through the pleura.

In this, as in other cases, where the paracentesis of the thorax is performed, it will be absolutely necessary to keep the wound open for some time; indeed the continual motion of the ribs, which

which tends to separate the lips of the wound from each other, with some other causes, render the perforations of the thorax much more difficult to be healed up than wounds in any other part of the body. A discharge of matter therefore continues for a considerable time, and frequently for life. This inconvenience must be submitted to ; for, when the wounds are suffered to heal up on the outside, which they will often do, new collections of matter are formed from within, and the external cicatrix is burst open, or a new operation becomes necessary.

## CHAP. X.

*OF BRONCHOTOMY.*

THIS operation consists in making an opening into the windpipe, when, by any affection of the upper part of it, respiration becomes so much impeded that life is endangered. Bronchotomy may be rendered necessary by any extraneous body falling into the glottis, which cannot be instantly removed ; by swellings in the glands of the upper part of the fauces, or the glands which lie there ; schirrous tumors compressing the trachea arteria ; a piece of meat sticking in the œsophagus,



œsophagus, which cannot be got down into the stomach; or, lastly, it is of great use in drowned persons, in order to blow air into the lungs, which may justly be considered as one of the most efficacious methods of recovering them hitherto attempted. In all cases where the operation is necessary, it must be performed with the greatest expedition; for the delay of a few moments will often put a period to the person's existence; and experience has determined, that, in almost every case, a total stoppage of respiration for only five minutes destroys the life of the patient irrecoverably. In performing it, the patient is to be laid upon his back on a table, and well secured by assistants; an incision of about an inch in length must be made through the skin and cellular substance, on the middle and external part of the trachea, beginning at the lower part of the thyroid cartilage, and continuing it about an inch farther down. Separating then the sterno-thyroidæi muscles, which by this incision are brought into view, the cellular substance between the upper and lower parts of the thyroid gland is to be carefully divided; by which means the trachea itself comes into view; and we may then instantly relieve the patient, by making an opening between two of the cartilages. The most proper instrument for making this opening is represented Plate 2. Fig. 4. The ca-

nula here made use of ought to be two inches long ; for, if made shorter, it will be in danger of its being pushed out of the trachea altogether, should any considerable swelling take place in the integuments. On the other hand, by making it too long, the back part of the trachea would be in danger of injury. To avoid this, it will be necessary to interpose between the broad ring of the canula and the divided integuments several compresses of linen, slit halfway through their length or breadth. The canula is thus to be inserted through the middle of the slit ; and, when any swelling supervenes, one of the compresses can be withdrawn, without giving the patient any trouble, or it may be replaced with equal ease which could not so readily be done, if (as some have advised,) the compresses were not cut before the canula was introduced. As the canula itself, however, is liable to be choaked up by the great quantity of mucus secreted in those parts, and thus respiration might be impeded, it will be proper to have it double, so that one may be taken out and cleaned, while the patient breathes through the other. As soon as the canula has entered the cavity of the trachea, the stilette must be withdrawn, and the canula secured by a piece of tape tied round the neck. The time of its stay in the wound must be determined by the time necessary to remove the cause of the obstruction.

struction to respiration. If any extraneous body has got into the trachea, we must not attempt either to search for it with a probe, or any other instrument of the kind, from the wound just now made, after you have performed bronchotomy, and secured the canula, you must examine the trachea with a probe bent for the purpose from the mouth. Having ascertained its real situation, we must make another opening directly opposite to where it is, and extract it. When swellings of any kind render the operation necessary, the proper means for discharging or otherwise removing them must be taken; and, until these are totally removed, the canula must be allowed to remain in the windpipe, after which the wound may soon be healed, by drawing the skin over it, and retaining it in its place by a slip of adhesive plaster.

Sometimes a great degree of suffocation is induced by the mere swelling and suppuration of some of the glands in the neighbourhood of the trachea, inasmuch, that the operation of bronchotomy seems to be as requisite as in the most urgent cases. But here the patient may always be relieved by a simple incision into the tumor, to evacuate the matter. The most eligible method of making this incision, is by means of a lancet concealed in a canula as represented Plate 3. Fig. 1. A scalpel wrapped up with linen,  
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with only the point bare, has been commonly recommended and used for this purpose ; but it cannot by any means be rendered equally safe with that just recommended, where the adjacent parts are defended from injury by the canula, and only the point of the instrument is admitted to wound the tumor in the proper place.

## CHAP. XI.

*OF OESOPHAGOTOMY.*

**By** œsophagotomy is meant the cutting open the œsophagus, when any substance happens to stick in it too fast to be got out, either by pushing it downwards, or by the efforts of the patient to discharge it upwards. We cannot, however, recommend this operation as eligible in any case, where without it the death of the patient is not altogether certain, since there are only two instances on record of its having been performed with success. There are indeed several examples of wounds in the œsophagus being healed, both in men and in brute creatures, so that we need not absolutely despair, even where no other remedy than this very doubtful one presents itself. In general, however, it can scarce ever be  
necessary

necessary merely from any solid body sticking in the œsophagus, because either the substance itself will dissolve, or a partial suppuration take place in the œsophagus, by which it will get down into the stomach. The most deplorable cases are those in which the œsophagus itself is compressed by schirrous tumors which arise in its neighbourhood, or where such a swelling takes place in itself as entirely to shut up its cavity. Where these happen to take place in the upper part of the canal, there is a possibility of prolonging life for a short time, by opening the œsophagus, and thus, conveying aliment into the stomach. If they are seated low down, the operation is evidently useless.

Should this operation ever be thought advisable, it ought to be performed on the left side, to which the œsophagus is supposed naturally to incline. The patient is to be secured in the same manner as for bronchotomy, and an incision made through the skin and cellular substance, as directly opposite as possible to the obstructed place, if it be done with a view to remove an obstruction; the muscles which are then laid open to the sight, are to be pulled aside with a blunt hook, and the trachea in like manner pulled to the opposite side, that the œsophagus may be discovered as plainly as possible. If the obstructed place now come in sight, the wound is  
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to be made directly upon the obstructing body, which must be extracted by a pair of small forceps ; but, if the obstruction happens to be farther down than we can with safety have access to the œsophagus, we must enlarge the incision as far as possible, so that the forceps may be able to reach it, and draw it out. After the operation is performed, however, it will be a matter of no little difficulty to heal up the wound ; for the sides of it will be constantly torn from one another by the action of deglutition, as often as the patient eats or drinks. Abstinence, therefore, as far as possible, is to be recommended, and only small quantities of the most nourishing diet in a liquid form allowed ; the patient is to be forbid to move his neck, and we are to use every method, as with wounds in other parts, to heal it up as soon as possible. If, on the other hand, the operation has been performed with a view to convey nourishment into the stomach, when the patient was distressed by a tumor, either in the œsophagus itself, or some of the neighbouring parts, there will be a necessity for keeping the wound open as long as the tumor remains, or the patient lives.

## CHAP. XII.

*OF WOUNDS AND CONTUSIONS OF THE  
HEAD.*

THE injuries to which the head is liable are of several different kinds. 1. Those in which the external integuments are wounded with a sharp instrument, which do not penetrate to the cranium. 2. Where, along with the wound, there is considerable laceration of the parts. 3. Where there is a contusion by some obtuse or blunt body, without any wound. 4. Where there is not only a contusion, but a wound also, yet without any evident affection of the cranium or its contents. 5. Where the pericranium or membrane surrounding the skull, is injured by cutting, bruising, or otherwise. 6. Where the cranium itself is depressed, fissured, or fractured, commonly with some extravasation of blood upon the brain. 7. Where, without either fracture or wound, the brain has been injured by a violent concussion, from a fall or otherwise, in such a manner as to induce all the symptoms attending the worst kind of fracture. Of all these we shall now treat in their proper order.

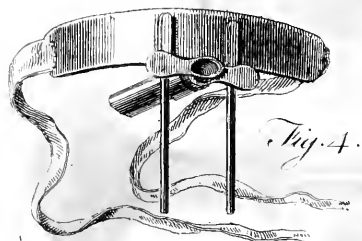
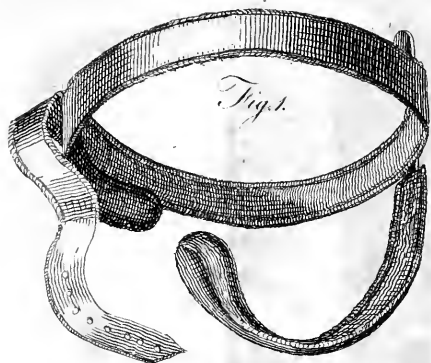
## SECTION

## SECTION I.

*OF INJURIES AFFECTING THE EXTERNAL INTEGUMENTS OF THE HEAD.*

THE least dangerous of all these are the wounds made by a sharp instrument, which does not penetrate very deep, because here there is no contusion, and consequently little danger of any affection of the pericranium or brain itself. If the wound happens to be very small, the symptoms are more alarming than where it is of considerable extent; for, if the aponeurosis of the muscles happen to be wounded, and the external orifice be not of magnitude sufficient to allow a free discharge to the matter, a kind of erysipelas will frequently be the consequence. The remedy in this case, is to enlarge the external wound, and take every method in our power to prevent the inflammation from rising to too great an height. Where the wounds are originally of considerable magnitude, they ought, as in all other cases, to be healed by the first intention; for, if any great degree of suppuration comes on, the erysipelas may perhaps come on; though, by proper treatment, this will generally

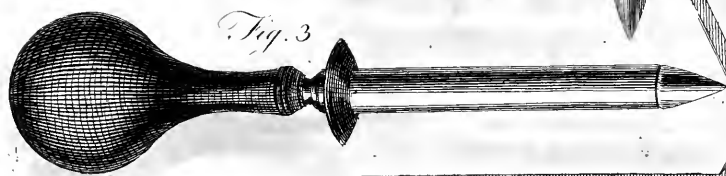




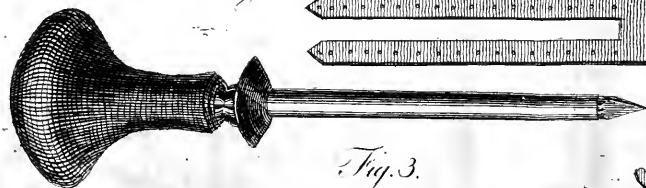
*Fig. 3.*



*Fig. 3.*

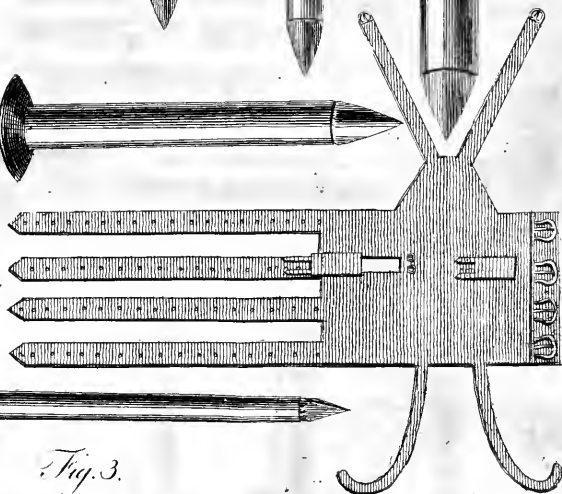


*Fig. 3.*



*Fig. 3.*

*Fig. 2.*





go off, without any bad consequence. When the integuments are divided to a considerable extent, it will be proper to bring the edges of the wound into contact, and unite them by means of the twisted suture. Should any dust or filth have got into the wound, which is very often the case, we must wash it carefully off with warm water before the suture is made use of. A pledget covered with an ointment of wax and oil, is to be put over the whole, and the patient for some days kept on a low diet, in order to prevent any inflammation, which in all cases of wounds of the head is extremely dangerous. Should any inflammatory symptoms, however, occur, the patient must be bled to twelve or fourteen ounces from the jugular vein; the evacuation being repeated as his strength can bear, and circumstances require. If he is young, and of a good habit of body, nothing else will generally be requisite to accomplish the cure; in five days we may remove the pins or stitches, but it will be necessary to keep the part covered for some days more with the plaster, until it be completely cicatrized.

This treatment will apply very generally to wounds that are not of any great extent, or which do not reach quite down to the cranium; but, where a very large wound is made in the integuments, especially if any considerable part

of the pericranium is laid bare, all attempts to heal the wound by the first intention will prove abortive, and not only a suppuration will take place, but collections of matter are formed in several different parts of the integuments. It will be necessary then to give vent to the matter, by making punctures with a lancet in some of the most dependent parts of the integuments. The wounds are then to be dressed with charpee and the ointment of wax and oil already recommended; the dressings are to be kept on by a nightcap tied below the chin, and made as tight as the patient can bear it, by pins inserted at the forehead and occiput. Thus, in general, the sides of the scalp where the matter was collected, will be kept in contact, and soon coalesce. We cannot, however, in all cases, promise that a cure will be thus completed. Frequently, when the pericranium is much injured, or indeed even when the integuments are greatly lacerated, an inflammation will suddenly arise, and spread over great part of the head, extending far beyond the limits of the original injury, and which cannot by any means be removed. After this has continued for some time, a considerable quantity of very foetid matter will be discharged, and a large portion of the aponeurosis of the occipito frontalis muscle become floughy; and the cranium itself laid bare for a considerable

considerable way. This case is more dangerous than the former ; but even here it will be proper to bring the edges of the wound together as much as possible ; the matter must be let off at every place where it can have a free vent. The patient's strength must be supported by nourishing food, and generous wine, and other cordials, along with the free use of the bark. The dressings must in this, as well as in all other cases of wounds in the head, be of the softest and mildest kind ; and in this way the patient will commonly be restored to health in a short time, if he lives temperately ; and is not very far advanced in life.

In many cases, however, it unfortunately happens, especially in large towns, that patients, so far from keeping themselves regular, live in a continual state of intoxication, even after receiving very severe injuries on the head. In such people, the upper part of the face, as well as almost the whole of the rest of the head, is affected with inflammation and tumor ; the skin assumes a yellow colour, and becomes filled with ferous blisters. There is also a considerable degree of colourless swelling, insomuch that the eyes are sometimes closed by it ; the whole retaining the impression of the finger, but not painful to the touch. The skin is hot and dry, the pulse quick, with thirst, nausea, and vomiting.

ing. These symptoms continue and increase, until at last they terminate in death, notwithstanding the use of every remedy both external and internal.

Where symptoms of this kind affect a patient who has lived regularly and temperately, they are much less dangerous than when one of another description is attacked by them. In the former, it will be sufficient to take away a few ounces of blood from the jugular vein, to give a gentle laxative, and repeat it as occasion may require, and to exhibit diaphoretic medicines, so as to keep up a gentle perspiration, by which the fever will commonly go off on the fifth day, and the wound will have a healthy appearance, and begin to heal. When the symptoms run high, however, the patient will bear bleeding to a much greater degree than those who labour under a true erysipelas; and, in that disorder of which we treat, emollient cataplasms may be used with great advantage, though they cannot be so in a true erysipelas. Warm fomentations are likewise of use, when the bad symptoms arise from matter confined between the pericranium and muscles. But, when we are sure that this is the case, a division of the parts down to the bone will almost always remove the most alarming complaints, and ought certainly to be practised  
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in every case ; nay, where this is done in time, it is seldom that any thing else will be necessary.

Any injury done to the integuments of the head by contusion, provided the cranium or its contents be not affected, is not attended with danger. If a tumor arises, it is for the most part very easily discussed, or the blood it contains may be let out by a small opening. In many cases, however, where this tumor containing extravasated blood is carelessly examined, it will feel as if the cranium itself was fractured. Hence some unskilful practitioners have been induced to remove a large portion of the scalp, with a view to perform the operation of trepanning the skull ; and thus, have given their patients much unnecessary pain. But the symptoms attending a fracture of the cranium are in general too well marked to pass unnoticed, even when the slightest injury is done to it. In general, no remedy will be necessary for the tumors which arise on the head in consequence of a slight blow, farther than the application of discutient remedies, of which one of the best is a solution of crude sal ammoniac in vinegar and water, or proof spirit. Should this fail, there will be a necessity for having recourse to incision, in order to evacuate the contents of the tumor. The opening may be treated as a simple wound, and will generally heal up without any trouble. If  
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it does not, we may be sure that there is some injury done to the brain, and we must have recourse to the methods hereafter to be described.

## SECTION II.

*OF THE AFFECTIONS OF THE BRAIN ARISING FROM COMPRESSION, BY FRACTURE OF THE CRANIUM, OR EXTRAVASATION OF BLOOD, OR OTHER FLUID, WITHIN ITS CAVITY.*

THESE are always extremely dangerous, though sometimes they do not make their appearance till after a considerable interval. But at whatever time they come on, they are uniformly of the same kind, viz. such as arise from a compression of the nerves, as stupidity, drowsiness, and at last loss of speech and voluntary motion. Where the injury is violent, these come on immediately; but it frequently happens that they make their attack after, in consequence of wounds or bruises, which at first were deemed very slight, and scarcely worth notice. The reason of this can only appear from an attentive consideration of the connection between the pericranium itself, and the meninges, or membranes of the brain, called the dura and pia mater.

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The cranium itself is in many parts composed of two bony plates called its two tables, between which is a kind of medullary substance called the diploe, consisting of an infinite number of cells filled with blood. On the outside is the membrane called the pericranium, firmly attached to the subjacent bone by innumerable small vessels, which discover themselves by bloody points on the surface of the bone, if the membrane is forcibly pulled or scraped off from it in a living subject, especially in a young one. These vessels all communicate with the diploe, as do also those of the dura mater, or membrane which lines the skull internally. It has indeed been supposed by many, that the dura mater is not connected with the cranium by any vessels except at the futures; and that every where else it is loose and unconnected, being alternately elevated and depressed, and performing a kind of oscillatory motion. This opinion, however, is altogether unfounded; for the dura mater undoubtedly serves the purpose of a periosteum to the internal part of the cranium, as the pericranium does to the external surface. Hence, if part of the cranium be forcibly pulled away from the dura mater, innumerable small bloody specks will appear on the surface of the latter, which, though wiped off, will instantly make their appearance again. Thus we see that  
there

there is a constant communication carried on by means of these smaller vessels between the outside and inside of the cranium. If therefore, by a blow or other injury on the head, any of the vessels which make a communication between the pericranium and subjacent bone should be broken, the diploe, the internal, as well as external table of the cranium, and the dura mater itself, may be thus affected. Sometimes, indeed, by blows, or falls on the head, some of the small vessels by which the above mentioned communication is carried on, are injured in such a manner, that they cannot execute their office in a proper manner, even though there may be no effusion of their contents. In consequence of this their coats are inflamed, and become sloughy; the membranes separate from the bone; the dura mater on the inside, and the pericranium on the outside. After such separation, the dura mater likewise becomes inflamed, and at last sloughy; producing matter from its surface, which being closely connected, compresses the brain in such a manner as to produce the most violent symptoms, certainly ending in death, unless some relief be speedily given.

As the dura mater is connected by one set of vessels to the cranium itself; so is it, by a set of similar ones, to the pia mater, which lies directly under it. These may in like manner be injured,

jured by a violent blow on the head; and in this case the matter will be collected on the surface of the brain itself, or between the membranes; as well as between the cranium and dura mater; and, when this happens, the symptoms must always be the more violent in proportion.

Sometimes the vessels, instead of being only injured in such a manner as to incapacitate them from performing their office, are actually ruptured, and thus a quantity of blood will be extravasated between the cranium and dura mater, which will be greater or less according to their size and number. By this it is evident that all the symptoms attending a compressed brain must be occasioned; but it is remarkable that these are not always severe in proportion to the quantity extravasated; for sometimes the most grievous symptoms will be occasioned by a very small extravasation, while a large one will not be attended with any thing remarkable for a long time. In general, however, the urgency of the symptoms is proportioned to the quantity of extravasated fluid; but there is a considerable difference between the symptoms arising from an inflammation of the membranes, and those which take place after an extravasation. The former never induces at first the stupor and loss of sense which take place in consequence of the latter.

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The patients complain of pain in the head, restlessness, want of sleep, nausea, and vomiting, shivering, the pulse quick and hard, with an hot and dry skin. All these symptoms increase without any possibility of mitigation by external or internal remedies, and before death the patient is attacked with delirium and convulsions. The symptoms of compression by an extravasated fluid, are, as has already been mentioned, giddiness in the head, nausea, and vomiting, loss of sense, and voluntary motion; to which we may add a dilatation of the pupil, as in the hydrocephalus, when the patient is exposed to a strong light. He snores, as in an apoplexy, has convulsive tremors in some parts, a paralysis in others, especially in those of the side opposite to that which was injured; there is frequently an involuntary evacuation of the urine and fæces; the pulse is oppressed and irregular; and where the injury has been violent, a flux of blood sometimes takes place from the mouth, nose, ears, or eyes. This last is the most certain sign of an injury done to the brain by an extravasation of blood within the cranium; for all the other symptoms may be produced by mere concussion, without any extravasation.

When any injury is done to the head, in consequence of which the membranes become affected with inflammation, there is sometimes so  
little

little indication of the mischief, that no notice is taken of it for a few days. The patient then complains of pain in the part which received the blow, but which soon extends itself from that point all over the head, attended with considerable languor and dejection of spirits. Next come on a giddiness, sickness at stomach, and inclination to vomit, a restlessness, and quick and hard pulse. These symptoms still continuing without abatement, a swelling takes place on the part which received the blow, though without much pain to the touch; nor does it rise very high, or spread far from the original seat. At this time, however, on laying open the tumor, there will be found a quantity of dark-coloured ichorous matter between the cranium and pericranium; the latter being also of a blackish hue, while the bone is yellower, and of a more dead colour than it ought to be. If, while matters are in this state, the dura mater be laid bare, it will be found to have separated itself from the cranium altogether, to have lost its colour also, and to be covered with matter, or a kind of mucus. The quantity and quality of the matter found between the cranium and its external covering, as well as between it and the dura mater, varies according to circumstances; being generally more or less in quantity, or more or less foetid, in proportion to the  
time

time the disease has continued, or to the violence of the injury received, though no doubt the habit and constitution of the patient must also be taken into the account.

When, along with this injury done to the pericranium, there is likewise an external wound, the symptoms proceed much in the same manner; the wound will at first look well, and a kindly suppuration come on; but in a few days it will begin to lose its healing appearance; its florid complexion will be exchanged for one that is pale and glassy; and, instead of the firm red granulations which ought to appear, it will begin to look flabby; the matter will become ichorous, and the dressings will stick to it, instead of coming off easily, as is the case in a sore that is disposed to heal kindly. But the infallible sign of an injury being done to the dura mater is, when the pericranium separates from the bone; for this it always, or at least for the most part does, as far as the internal membrane is injured, and no farther. During all this time the febrile symptoms go on, as already described, and the colour of the bone varies from a reddish and healthy appearance to a disagreeable yellow. If the blow happens to be on a suture, or near it, especially in young subjects, the suture will frequently separate to a considerable width, and a fungus shoot out from it, an erysipelas at  
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the same time attacking the rest of the head and face.

Sometimes, after a blow on the head has been received, a few bad symptoms will immediately make their appearance, and vanish in a short time. The patient will then feel himself perfectly well, excepting only a slight pain in the head, or perhaps not even that. After some days the above-mentioned symptoms will return with all the violence and fatal consequences that have been already described. If the febrile symptoms make their appearance, it denotes an inflammation and threatened suppuration of the membranes of the brain ; but if those which indicate a compression of that organ come on, it is probable that the mischief arises from an extravasated fluid. Unfortunately, however, there are no signs by which we can certainly distinguish the place of this extravasation ; for it may be either between the skull and the dura mater, between the dura and pia mater, between the pia mater and brain, or within the ventricles of the brain themselves ; or it may be at a distance from the place where the injury was received, and consequently be absolutely undiscoverable. We may, however, always ascertain the place where the dura mater is separated from the cranium ; for this never fails to discover itself by a tumor of the external integuments,

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and a spontaneous separation of the pericranium. In some wounds of the head, the pericranium itself is torn off from the skull by violence; yet this is not always attended with any of the bad consequences which attend a spontaneous separation; for, if the part which is torn away be replaced along with the portion of the scalp which was turned up with it, it will very frequently unite with the bone as before. In accidents of this kind, therefore, where the scalp and pericranium happen to be lacerated in such a manner, we are not to extirpate the loose pieces, but, after washing and cleaning them carefully, to put them back in their places. If the pericranium does not unite with the subjacent bone, we may then remove it along with the loose piece of the scalp, and we need not fear any worse consequences from leaving the skull bare, than an exfoliation from it; though even this does not always take place. An exfoliation of a bone is occasioned by some injury done to its vessels, by which they are disabled from carrying on the circulation through a part of it as formerly; but this does not necessarily follow a mere denudation of it. If violent methods, such as scraping, burning, or the application of hot and spirituous tinctures are used, an exfoliation must then undoubtedly take place, but not otherwise, unless some very considerable injury has been done to it along with the denudation.

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## SECTION III.

OF FRACTURES AND FISSURES OF THE SKULL, AND  
THE SYMPTOMS ATTENDING THEM, WITH THOSE  
ARISING FROM CONCUSSIONS OF THE BRAIN.

WHEN the head is struck with such violence as to break the skull, the injury may be of such a nature as to separate a piece entirely from the rest, which is called a *Fracture*, or it may split it for a greater or lesser extent, which is called a *Fissure*; or sometimes, though rarely, the internal table may be broken, while the external one remains whole. Sometimes, though the bone is broken in such a manner as to have a part entirely separated from the rest, the loose piece will yet keep its place, without being beat in upon the brain; in which case the patient is said to sustain a fracture without depression; but, when it is beat in upon the membranes, or into the substance of the brain, it is called a fracture with depression; but, whether the fractured pieces are depressed or not, the fracture of the internal table very seldom corresponds exactly with that of the external one; for the internal table is thinner and more brittle than the  
external

external one; and, on this account, the fracture in it almost always extends farther than the external table.

What has just now been said of fractures, applies equally to fissures. When the skull is fissured by a violent blow, it is possible that the adjacent parts may be depressed, or bent down a little, even without any fracture; and, in children, a depression of the skull may take place even without a fissure. But the most unaccountable, as well as most dangerous affection of the the cranium, is what practitioners have been accustomed to call a *counter-fissure*; that is a fissure which takes place not only at the place where the injury was received, but on the opposite side, or at some distance from it. Happily, however, this kind of fissure does not often occur; for, as it gives no indication of its existence by any swelling or discoloration of the integuments over the place, we have no method of discovering it; and yet it is equally productive of mischief with the worst species of fracture, though perhaps not so suddenly. A notion has indeed been entertained, that fissures of this kind happen in a part of the cranium directly opposite to that which received the injury; and, if this were true, they might be sought for and found; but unhappily we are deprived even of this precarious mode of finding them; for they  
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may take place much nearer the part that received the blow, while that directly opposite to it remains perfectly sound. The only thing, therefore, that can be done, when by the violence of the symptoms it is suspected that the cranium has received some injury, is to examine the head all over with the greatest accuracy, by pressing strongly upon every part with the fingers; and, if the sensibility of the patient be not entirely gone, he will give some intelligence of the affected part being touched, either by complaint, or by moving his hands, when the surgeon presses upon it.

The symptoms which take place in consequence of a fissure or fracture of the cranium are those formerly enumerated, as arising from the inflammation of the membranes, or compression of the brain by an extravasated fluid. They do not, as in other fractures, arise from the injury done to the bone, but from that done to the brain in consequence of it, or in the moment that the pressure was made. Where a fissure takes place, unattended with any immediate extravasation, it is plain that the injuries already mentioned as done to the pericranium and dura mater, by the rupture of their small connecting vessels, must take place, and, if the fissure is considerable, in a much greater degree than from a simple contusion; because the di-

ploe itself is wounded, and apt to pour out its blood upon the surface of the membranes. Where the fissure is attended with depression, the symptoms of a compressed brain generally take place immediately; and much more must they do so in case of a fracture, where the loose piece is beat in upon the brain. The same symptoms will likewise attend any considerable, sometimes even a very small, extravasation of blood or serum happening at the time the injury is received; though even of this we cannot be certain, as very considerable collections of fluid have happened, and even the bones been depressed, for some time before the patient made any great complaint. On the other hand, it is certain that many of the bad symptoms arising from a fracture or depression of the cranium may take place merely from that injury to which the brain is liable, commonly called a *concussion*. It is not known what the nature of this injury is; only we are certain, that, in many of those who have been killed by falls or other accidents, the cranium has been found perfectly sound, the meninges in the same state, and the brain, as far as could be judged, quite uninjured; the heart, bowels, large blood-vessels, and every part which, by its destruction, could be thought to produce sudden death, remained perfectly sound. The person's death, in such cases, has been attributed

to the violent shake given to the brain, which operates like an electric stroke, and at once extinguishes the vital principle. In some cases, where symptoms of compression occur, there is not found any marks of injury upon the head, the patient, by proper treatment, will get well, and, if the brain has not been hurt in any other way, will recover his health entirely. All the symptoms above-mentioned, as proceeding from a compressed brain, are not, however, the usual attendants on concussion. Those which practitioners have been usually accustomed to derive from that cause, are loss of sense and voluntary motion, dilatation of the pupil, involuntary discharge of urine and fæces; the pulse weaker than in other cases, without that apoplectic stertor, convulsions, or discharge of blood from the eyes, ears, or nose, which commonly take place in cases of extravasation or compression:

It is thus a matter of very considerable difficulty, when a surgeon is called to a patient, and finds him lying insensible, to determine whether the skull or its contents have received any permanent injury, or whether the symptoms are merely the effects of concussion. The only direction he has, is by the absence of those symptoms above-mentioned, especially of the apoplectic stertor, and oppressed breathing. In cases of concussion, the patient generally appears as  
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if he was in a quiet sleep, with a soft, equal, and regular pulse; neither will he be relieved by blood-letting, which is commonly though not always the case where the brain is compressed. This last evacuation, however, is a dangerous experiment; for, in all cases of concussion, the symptoms are rendered more violent by blood-letting, and the pulse will sink after it as in a nervous fever, even when only a small quantity has been taken away. Yet, as it is not always possible to discover at once whether the compression or concussion be the cause, it will in almost every case be advisable to begin with taking away a small quantity of blood. If, when a few ounces have flowed, there appear any signs of relief, such as the patient's becoming more sensible, his pulse fuller and stronger, &c. we have then encouragement to proceed, and may reasonably conclude that the patient labours under a compression of the brain. On the other hand, if the pulse evidently sinks, and the other symptoms increase, we may conclude that they originate from a concussion of the brain; and we ought instantly to desist from the operation.

After the patient has received the injury, of which concussion only is the cause, he will perhaps fall down, but soon recover his senses; he will then complain perhaps of vertigo and tinnitus

nitus aurium, headach, dimness of sight, and some deficiency of intellectual faculties; nevertheless he will be able to walk about, even when these symptoms continue in a very high degree, and, if no permanent injury has been done, he will gradually recover; but, where the symptoms arise from compression, the case is greatly altered; for then, though the patient may perhaps recover for a little, and even appear well for several days, the bad symptoms will all return, and unless the proper remedy is applied, he will certainly die. Of this Mr Pott gives many instances; and in these, concussion, in a considerable degree, was probably joined with the other injury. In some of these the urgent symptoms, which immediately attended the accident, went off in a very short time, and the patient continued well for several days, nay even for weeks; and yet, after so long an interval, a train of symptoms would come on, which no remedy could alleviate, and which in all cases would have certainly proved fatal, had not the trepan been applied. It must be owned, however, that in the cases just now attended to, as well as in most others, a number of bad symptoms immediately take place when the cranium is injured in such a manner as to produce a compression of the brain, either by depressing the bone, or extravasating a fluid. Where the bad symptoms come  
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on a second time, we may generally suppose that they arise not from any fluid extravasated at the time the blow was given, or from any depression of the cranium by fracture or otherwise, but from that injury to the smaller vessels, which has already been taken notice of, as producing inflammation and suppuration of the dura mater. Sometimes, however, even where there is a fracture of the skull, the parts of the divided bone may unite without any bad symptom, and that even where a piece has been fairly cut off by a sharp weapon. La Dran mentions his having seen in the church-yard of Worms the skull of a person who had received such a wound from a sabre as had cut off a round piece of about an inch in diameter from the posterior part of the ossa parietalia. "This," says he, "had very probably been restored to its natural situation, together with the skin, for it was perfectly reunited with the cranium, and one might distinguish, both on the internal surface, as well as externally, the callus which had cemented them. What was very remarkable, (and shows the bone must have been replaced with very little care), one might see on the inside three small and very thin bony portions, which had probably been left between the dura mater and the piece of bone; to the last of which they were united in its middle, and adhered there  
very



very strongly. As the callus was quite formed, and become solid, like that which is found in fractures of the femur and other large bones, the patient certainly recovered of his wound, and owed his death to some other cause."

## SECTION IV.

*OF THE METHOD OF TREATING OF WOUNDS, AND  
OTHER AFFECTIONS OF THE HEAD FROM EXTER-  
NAL VIOLENCE.*

FROM the account given in the last section of the various symptoms attending injuries done to the brain, by blows or wounds on the head, it must be evident that no hurt on that part of the body can be supposed void of danger. What appears to us only to be a slight blow, not worth notice, may yet have produced a fissure of the skull, or such an affection of the membranes, as is sufficient to occasion the death of the patient, by fever and inflammation, in the manner already described; the utmost attention therefore is necessary, on the part of the surgeon, in every case where he happens to be called soon after the injury is received, though it unfortunately happens, for the most part, that this is neglected on  
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the part of the patient, till the bad symptoms have already come on. The surgeon is not, however, warranted to make any incision, much less to apply the trepan, unless some very urgent symptoms occur; for we must consider that the application of this instrument is a real injury of itself; and instances have been known, where, on applying it with a view to prevent the return of epileptic fits, the patient has died in a few days, from an inflammation taking place within the cranium, which there is not the smallest reason to suppose would have done so, had not this instrument been made use of. Neither are we to conclude, that, because a person has been rendered for some time insensible by a stroke on the head, that therefore the trepan is immediately to be applied; for this may take place from a momentary concussion, the effects of which soon go off. In such cases, therefore, if only a small tumor is left where the stroke was given, and the patient feels himself otherwise well, the surgeon is to act as if the discussion of the tumor were his only object; not forgetting, however, that bad symptoms may afterwards come on; and these ought to be guarded against with the utmost care the moment they begin to appear. As it is most probable that the tumor is occasioned merely by an effusion of blood, such as very frequently takes place from  
similar

similar causes in other parts of the body, similar remedies are to be applied. Half a dozen of leeches may be set on with much probability of success; after which we may use a mixture of four ounces of vinegar, with twelve of water, in which two drachms of sal ammoniac are dissolved. But, notwithstanding this, should the tumor continue, or increase, the contents ought to be evacuated by an incision, to which we are afterwards to apply a pledget covered with any kind of emollient ointment, a poultice being put over the whole.

In such cases it generally happens that the collection of matter is between the pericranium and bone. When absorption, therefore, cannot be promoted by the remedies above-mentioned, so that the pericranium may again adhere to the skull, the bare part of the bone, even though not exposed to the air, will become affected, from the want of circulation through the external plate; and in this way it may communicate an acriminous quality to the fluids which have been extravasated, and not absorbed. This acrimony may be communicated to the diploe, and from it to the internal table; and thus the circulation through it, and communication of the vessels between the dura mater and cranium entirely stopped, as has formerly been hinted at.

In this way it most probably is, that inflam-

mation is communicated from the pericranium to the dura mater; for the circulation by arteries goes no farther than the diploe, either from the one side or the other. In this manner also it is, that inflammation, with fissure, may terminate in suppuration. No fluid is possessed of any degree of acrimony the moment that it is extravasated; another process must be gone through before it is capable of being turned into matter. But, in such cases as those alluded to, if the connection between the pericranium and bone be completely dissolved in one part, the malady will quickly spread; and, as the pain and swelling increase, the detachment of the pericranium will become more and more considerable; a collection of matter will be formed internally, and it will then be necessary to remove a portion of the bone.

If, when the surgeon is called to a patient, he finds that the symptoms which come on immediately after the accident do not disappear, but that he continues to labour under an oppression of the brain, it will be necessary to have his head shaved, and carefully to observe whether there be any slight puffiness or tumor of the integuments, or whether there be any symptom of fracture. Should none of these appear, and the symptoms of compressed brain still continue, it will then be proper to examine the head  
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in the most exact and accurate manner, by firmly and deliberately pressing upon every part of it with the fingers of both hands. In performing this, the surgeon must carefully observe, whether, when he presses upon some particular spot, the patient does not shew signs of sensibility or of pain, by lifting up his hands to prevent a repetition of the injury, or by moving his head, groaning, &c. In this way I have seen several fractures detected; but, after all, should the patient still continue absolutely insensible, we must endeavour to learn his case from those who were near him at the time the injury was received. If they inform us that it was by a blow on the top of the head, or on either side, we are then authorised to examine the bone upon that spot, especially if we find that he shews any mark of pain when a particular part is touched. An incision is then to be made directly upon that spot to the very bone, which must also be laid bare for a space sufficient to allow a free examination of it. If here you should find the pericranium detached for a little way, with a small quantity of bloody serum extravasated between it and the cranium, you are authorised to remove a part of the bone; as we know that there is a possibility, though indeed it is a very rare occurrence, that the internal table may be fractured or depressed without any injury done

to the external one. Should it be found otherwise, however, and no mark of injury appear either on the internal or external table in that part, or on the dura mater below it, you must diligently search for a fracture in some other part, or what has been already described under the name of a counter-fissure. If the stroke has been given on the right side of the head, the counter-fissure will generally appear on the left; and *vice versa*; but we know from experience, that the most violent stroke on the occipital bone cannot occasion any fissure on the os frontis. Were not this the case, it is impossible but we must meet with it very frequently every winter, from the violent contusion on the back part of the head which people receive in skating. But, should the contusion have been received in such a place that we may reasonably expect a counter-fissure, the opposite side of the cranium is to be laid bare; and, that no reflection may be thrown upon the surgeon, for not attempting to relieve his patient by every means in his power, he ought to apply the trepan as nearly as possible on the part opposite to that which received the injury; taking care, however, to make the friends of the patient sensible of the extreme danger and uncertainty there is in this, as well as in every other case where the trepan is applied. If any counter-fissure happens to be discovered,  
there

there can be no doubt of applying the trepan as in other cases.

If any fracture or fissure be detected upon making the first incision, the surgeon must be cautious lest the edge of his knife should get between the divided edges of the bone, which, if they were considerably separated from one another, it is possible might happen. The fracture is to be followed, throughout its whole length, by the incision, unless it should run down towards the very basis of the cranium, which unfortunately is sometimes the case. Should it be on the os frontis, os occipitis, or any part of the ossa parietalia, and along with it a considerable depression of an oblong or circular shape, which is the usual form such depressions take, the scalp must be dissected away in such a manner as to allow a free inspection of the whole depressed part, as well as the whole of the fracture, but without removing any part of the integuments entirely. To effect this properly, it may sometimes be necessary to make a second incision, directly over the middle of the fractured or depressed part, at right angles with the first, in order to get the trepan easily applied to every part of the depressed bone; to do which, you must also carefully dissect the pericranium away from the subjacent bone. Should the integuments be so much lacerated as to admit a  
free

free examination of the fracture, there will not be any necessity for using the knife. If the fracture happen to run in a straight line, a simple incision will answer the purpose ; but, should it be angular, the incision must be made with angles corresponding to it.

When blood-vessels of any considerable size are divided, either by an accidental injury done to the head, or by the incision made by the surgeon, it is not, as in other cases, necessary to take them up by ligature before we proceed any farther in the operation. In no case whatever, is the loss of a great quantity of blood more necessary, for the relief of the patient, than in those of compression of the brain. The divided vessels are therefore to be allowed to bleed freely for a considerable time, until it appear that the patient is unable to bear the loss of more blood. The vessels are then to be tied up ; and, if any considerable oozing of blood should continue, which may be troublesome during the operation, it may be stopped by covering the edges of the wound with scraped linen, which can be kept in its place by an assistant.

Having now treated fully of every thing preparatory to the application of the trepan, we must next speak of those parts of the head where it is proper to apply it ; and, to understand this properly, it will be necessary to consider the  
fracture



fracture of the cranium, and the parts of which it is composed.

The cranium, or bony case which furrounds the human brain, is composed of eight bones ; only six of which come more immediately under the view of the surgeon ; viz. the os frontis, the two ossa parietalia, the two ossa temporis, and the os occipitis. These are united to one another by a kind of indented joinings, from their appearances called futures. The coronal future, running across the head from one temple to the other, joins the os frontis to the two ossa parietalia ; while these two bones are joined to each other by the sagittal future extending from the os frontis to the os occipitis ; and sometimes this future divides the os frontis in two, terminating at the root of the nose. The os occipitis is joined to the two ossa parietalia, and the posterior part of the ossa temporum by the lambdoid future, which runs to the basis of the skull on each side. The ossa triquetra are found only near the lambdoid future ; the ossa temporum are joined to the ossa parietalia by the squamous future. All these bones are, throughout the greatest part of their extent, composed of two tables, with a substance composed of innumerable cancelli filled with blood, and named *diploe*, between them. The external table is generally thicker and stronger than the internal, which is  
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the reason that the latter sometimes breaks, while the former remains sound. The diploe is not every where of the same thickness; and, in old age, it is in many places almost entirely obliterated. Hence the cranium itself is of very different thickness in different parts; and, especially in those parts where the inside is strongly marked by the arteries of the dura mater, it is remarkably thin, and in those thin places it is necessary to use great caution in applying the trepan.

All that part of the cranium to which the trepan can be applied is very smooth, and equal on the outside as well as inside, excepting those places where the arteries of the dura mater have furrowed it, as already mentioned; and these are principally the upper part of the temporal bones, and under part of the parietal ones.

The cranium is covered with the occipito frontalis and temporal muscles, those of the ear, and their tendinous expansions, above which are the cellular membrane, roots of the hair, and skin; the bones themselves being closely covered with the membrane called the pericranium, answering the same purposes as the periosteum in other bones. On the inside they are lined with a very strong membrane, named the dura mater, which likewise adheres very strongly,

ly, by means of its vessels, as has been already observed. Both the pericranium and dura mater adhere to the cranium more strongly at the futures than any where else; but, from a consideration of the anatomy of the parts, it would seem that the connection between the dura mater and futures was made by veins, rather than arteries, as the longitudinal sinus, which runs the whole length of the sagittal future, is only a vein, and is probably supplied by veins returning from the dura mater and pericranium through the diploe. Should this be the case, it is impossible that any inflammation can be produced in the manner that some authors have alledged; for a venous communication cannot produce any thing of the kind. Indeed, we observe frequently that internal inflammation takes place without the smallest sign of any thing like it externally. Possibly a stroke on the head may give such a shock to the bones, as to augment the action of the vessels in the part immediately within the skull, without doing any farther injury to any of them; and, by the neglect of proper remedies, this increased action may continue, and be gradually augmented, in such a manner as to produce inflammation. Thus, even an internal suppuration might take place, for the heat and moisture would make the inflammation advance very rapidly. Let us again suppose that inflammation

from the stroke has taken place externally, it is possible that the sympathy of the nerves may communicate it to the internal parts; for, from the cases related by Mr Pott, it appears, that, in consequence of suppuration on the external surface of the dura mater, the circulation of blood through the bone is entirely stopped. Hence it would seem that the bone was supplied with blood-vessels from the particular spot of the dura mater which lies immediately below it, and that these were destroyed by the inflammation and suppuration. Be this as it will, however, it is certain that by reason of injuries done to the external part of the head, very dangerous inflammations are communicated to the cranium, which not only produce the most grievous symptoms, but even death itself, in spite of the best remedies that can be applied, and that after the patient has been apparently well for weeks, or even months, after the injury was received.

The instruments by which any part of the skull is to be removed, are, 1. The trephine, represented Plate 3. Fig. 1. consisting of a circular saw worked by a handle, and having a sharp point in the middle to keep it steady. Formerly an instrument similar to that with which carpenters bore wood was made use of, but the saw was of a conical figure. This was called the trepan, but such inconveniencies attended this

this figure, that it has been difused, and the former is now only employed, especially in Britain, though without any good reason. The trephine, indeed, by reason of its cylindrical figure, has the advantage of the conical formed instrument just mentioned ; but this form is not essential to the other more than to it, and the trepan when properly fitted with a cylindrical saw, is undoubtedly preferable, on account of its cutting the bone in less time ; for it will be evident, from the figure of it, that twice as much time, or very little less, will be required to make a perforation with the trephine, as is necessary for doing it with the trepan. 2. The trepan with a cylindrical saw, as represented Plate 3. Fig. 2. and the method of using it will be evident from inspection. 3. A raspatory for removing the pericranium, Plate 3. Fig. 3. 4. A perforator. 5. A lenticular, for scraping the edges of the bone after the perforation is made by the trepan. 6. A pair of forceps ; and, 7. An elevator represented Fig. 7. for raising loose and depressed pieces of bone.

Most of those who have wrote upon surgery, incline very much to limit the operation of the trepan to a few particular places. Experience, however, hath now determined, that the trepan may be applied in almost any part. The most dangerous places are those near the basis of the skull.

skull. At the very basis it is impossible to apply the instrument, and hence we cannot, without considerable hazard, perform the operation on the under part of the occipital bone, or of the temporal bones. The futures, on account of the close adhesion to the dura mater, and their covering the sinuses, have been reckoned improper places for the application of the trepan, and it has been strictly prohibited to attempt any operation upon them, from a supposition either that a high and very dangerous inflammation might take place on account of the adhesion, or that the patient might be destroyed by an hæmorrhage from the opening of one of the sinuses. Both these suppositions, however, are founded on mistakes; for no greater degree of inflammation attends the separation of the skull from the longitudinal sinus, than what is occasioned by its separation from any other part of the dura mater; nor is the breaking of the vessels which form a connection betwixt this sinus and the future productive of any more dangerous hæmorrhage than in the rest of the cranium. It must be owned, indeed, that the bleeding may be so considerable as to occasion some embarrassment; but it is certain, that not only part of the sagittal future covering the longitudinal sinus may be removed, but even that sinus itself may be opened, without any fatal,

fatal, or even dangerous hæmorrhage ensuing. Mr Pott gives two instances of this. One was a boy of eight years of age, who had been struck with a stick; the other, a girl of sixteen, with an iron pocker. In the former, the longitudinal sinus was wounded by a splinter of the skull; so that blood issued from each edge of it. A trephine was applied on each side of the future, and afterwards upon the future itself; but at last it was found necessary to extract the splinter by means of a pair of forceps. The flux of blood was easily restrained, by a dossil of lint; and, after it was once stopped, it never returned. The girl had received a much more considerable injury. The sagittal future was likewise broken, and the pieces so large, and so loose, that they were easily extracted without any perforation; and, after they were taken away, the longitudinal sinus was left bare for at least two inches, but no hæmorrhage ensued. In the course of Mr Pott's attempts to cure her, he opened the sinus itself, and allowed the blood to run, till the patient (who continued insensible) seemed to be in a state of delirium. The orifice was covered with a little soft lint, which was kept on by the nurse for a short time, and the hæmorrhage never afterwards recurred. All the sinuses, are of the nature of veins, and therefore there cannot be such a difficulty  
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in stopping them, as there would if they were of an arterial nature; though it must certainly be always eligible to avoid them if possible. Hence it is dangerous to apply the trepan upon the lower part of the occipital bone, because there are many very considerable sinuses lying under it, and the thickness of the bone itself is also very unequal. It is also dangerous to apply the trepan upon the frontal bone, just above the orbits of the eyes; because the two laminæ, of the bone are there separated from one another to a considerable distance by the frontal sinuses; the internal surface being likewise very unequal. The temporal, as well as the parietal bones, are very deeply furrowed; and therefore it is improper to apply the trepan there, except in cases of necessity; but, where the patient's life is evidently at stake, we ought not to omit the operation when there is a possibility of performing it. If the injury is in the frontal bone, we may perforate the sinuses with safety if proper caution is used; we may dissect off the muscles from the occipital bone, or we may trepan directly above the longitudinal sinus itself, as has been clearly evinced by Mr Pott. We are not, however, to apply the trepan hastily upon such places, or in any case excepting those where the patient's death would unavoidably take place if the operation could not be performed; and it  
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is certainly better to try a doubtful remedy than none at all.

Trepanning is necessary in all cases attended with symptoms of a compressed brain, which cannot be relieved by evacuations, or the other remedies we have recommended, and that whether there be any fracture or not, provided we have any thing to direct us where to apply it. Indeed, it is to be regretted that the operation is too frequently delayed till the performance of it cannot relieve the patient ; but the uncertainty which unavoidably attends cases of this kind cannot but occasion a considerable degree of hesitation about the fore, where it is necessary to apply the trepan, and where it is not. In general, we may conclude, that trepanning is always necessary where any portion of the skull is depressed, and cannot be raised to a level with the rest, without removing it altogether, or making perforations in the neighbouring sound bone, through which we may introduce instruments to raise it up. It is also useful, nay indispensably necessary, in all cases where any extravasation or collection of matter within the cranium is indicated ; for every collection of extravasated or purulent matter within the cavity of the skull is productive of as bad symptoms as a depression of the bone itself. It is even attended with worse consequences, because

a depression or fracture of the bone is visible, and always takes place at the time the injury is received ; whereas the place of extravasated liquid or purulent matter cannot be discovered, and the symptoms by which such a thing is indicated sometimes do not come on till after a very considerable interval. Hence also it is so often necessary to make several different perforations in the skull in consequence of a single injury received. A depression, for instance, may take place in one part, and an extravasation in another, at a distance from it ; or the small vessels of the bone itself may have been injured, in such a manner as to bring on an inflammation, with all the bad consequences already enumerated, and that in a place so far distant from the seat of the original injury, that we could never have suspected it. Sometimes it may happen that there is a fissure directly above the place where the fluid is extravasated, while in another the pericranium is separated from the bone. In cases of this kind we ought to apply the trepan to one side of the fissure, and, if nothing appears there, to the other ; and, in all cases, where, with any degree of probability, we can suppose that an extravasation or collection of matter exists, we are warranted to perforate. It is true, indeed, as we have already observed, that the operation itself is by no means void of danger ;

ger ; but it is to be considered, that, where the brain is compressed, the patient will infallibly die, if not very speedily relieved ; and therefore we are not to hesitate when there is a possibility of doing good.

Having determined upon performing the operation, the first thing necessary is to make an incision on the injured part. This may be known in the various ways already mentioned, particularly, by the appearance of a tumor ; and the surgeon may at any time readily ascertain this, by dividing the integuments to the bone with one stroke of a scalpel. Should the cranium be much injured, however, there is some danger of allowing the edge of the knife to slip between the divided edges of the bone, by which the brain might be wounded. The brain might also be hurt by pressing the knife too hard upon a loose piece of the cranium, and thus forcing it down out of its place ; but these accidents are easily avoided, and no surgeon, in any degree cautious, will be in danger of them. Where it can be done with safety, the incision ought to follow the fracture throughout its whole length ; but, as fractures frequently terminate at the very basis of the skull, it is evidently impossible to follow them in that case. It is not in any case necessary to remove a part of the scalp, nor even to make a crucial incision in it, as most authors

advise; because the divided integuments always retract sufficiently to show the extent of the fracture. Should the injury, however, be done to any part of the *os frontis*, *ossa parietalia*, or *os occipitis*, attended with a considerable depression of a circular or oblong shape, which is that commonly assumed by depressions in these parts, it will be necessary to dissect away the scalp in such a manner as may afford a view of the whole fracture at once. But still there is no necessity for removing any part of the scalp; only it will be proper to make an incision of considerable length immediately over the centre of the depressed part, at right angles with the first one, to get the trepan properly applied to every part of the depressed bone.

Where the integuments happen to be so much lacerated, that the bone may be examined without making any incision, there is no necessity for using the knife at all; but this happens very seldom. In other cases, the incision must follow the fracture as exactly, and as far as possible. Should any blood-vessels of a considerable size happen to be divided, they ought to be allowed to bleed freely, this evacuation being of the utmost service to the patient; but, should he be apparently in any danger from the hæmorrhage, it may be restrained by a ligature; or, if blood should continue to ooze from the edges of the wound,

wound, they may be covered with dry lint, which is to be kept on by an assistant.

When the trepan is to be applied, the patient must be laid upon a mattress placed on a table, and his head kept steady by a pillow held firmly by an assistant. On examining the state of the fracture, then, if any parts of the bone happen to be entirely separated, they may be easily extracted by the forceps represented Pl. 3. Fig. 6. By the same instrument we must remove any splinters of bone which may happen to be driven into the dura mater ; and through the opening we must attempt to discharge any blood, serum, or extraneous matter of whatever kind. It may happen, however, that the bone is depressed in the middle and on two of the sides, but that, at the opposite points, it is fixed, and on a line with the rest of the skull. Or, lastly, it may happen, that only one part of the bone is beat down on the side opposite to the fracture. We must, in these cases, by means of the raspatory represented Pl. 3. Fig. 3. remove as much of the pericranium as will allow room for the application of the trepan. This instrument, with its different circular heads, is represented Pl. 3. Fig. 2. and, in the hands of a skilful operator, cuts the bone very easily and quickly. He has only to put his left-hand cautiously on the top of it, while, with the other, he carefully turns  
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the instrument. Should he, however, rather choose to make use of the trephine, he may have the handle of this instrument fitted to the saws of the trepan.

The operation is begun by making a small hole on the sound part of the bone, by the instrument called the perforator, represented Pl. 3. Fig. 4. which hole is to be made as near to the edge of the fracture as possible, that we may, along with the sound part, take out a portion of the depressed part also. As soon as this hole becomes deep enough to receive the pin in the centre of the circular saw, we are to insert the latter; and this, by the hold it has of the bone, will keep the saw steady in its place, until the groove cut by its teeth becomes sufficiently deep for the purpose. Whenever we observe this to be the case, the centre-pin is to be taken out, by unscrewing the pin, and moving it to the top of the slit; after which we may fix the instrument as before, by turning the screw. It is very necessary to attend to this; for, should we neglect to take out the pin, there can be no doubt that the projecting point of it would injure the dura mater before the circular piece of bone could be removed by the saw.

In finishing the operation, we must take care to make the pressure equable, whether the trepan or trephine be used; though, for the reasons  
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sons already given, I would always advise the use of the trepan. When we make use of the trephine, only one hand can be employed, and half a circle cut at a time, and we must finish the perforation by working the saw backward and forward till we have divided the whole thickness of the bone. This cannot be effected without both time and labour to the surgeon, and much trouble to the patient. If only one perforation, however, is to be used, the surgeon may do it either with the trepan or trephine; but, where two, three, or more are necessary, then the trepan is obviously the instrument to be applied. During the time that the bone is cutting, great caution ought to be used on the part of the operator; the instrument, whether trephine, or trepan, is to be removed from time to time, and well cleaned with a brush from the blood and bone-dust, which would prevent it from working freely. As soon as it is taken out, the depth of the cut bone ought to be carefully observed by means of a quill shaped like a tooth-pick. Should one side of the cut happen to be deeper than the other, which is very often the case, we must press slightly upon those parts that are deeply cut, and more upon such as are more shallow. When the instrument has reached the diploe, (which the operator will easily know by the diminution of resistance, as well as by

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by the discharge of some blood from the groove), more caution than ever will be necessary, because the inner table of the skull is much thinner than the outer one, and in some parts not only naturally thin, but deeply grooved by the blood-vessels. We must, therefore, during this part of the operation, have very frequent recourse both to the quill and brush; and, if we find that, in any part, both tables are fairly cut through, we must press none at all upon that part, but transfer the pressure entirely to that which is not yet divided; and which any one, who has ever seen an instrument similar to the trepan ever used upon wood, must easily know how to do.

Proceeding in this manner, we must continue to make perforations all round the depressed part, until it be found possible to remove it entirely, if necessary, or raised to the same level with the rest of the skull, which elevation will be most easily performed by the instrument, represented Pl. 3. Fig. 7. Introduce the point of this cautiously at the opening, and gently push it in below the edge of the depressed bone; cautiously depressing the handle at the same time until the injured part of the skull is perfectly raised to a level with the rest; and it is evident, from an inspection of the figure, that the form  
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of this instrument is the best that can be contrived for the purpose of raising the bone.

Thus, the operation of trepanning will be completely performed, and the patient have every benefit from it which it can give ; for the whole intention of it is to remove compression from the brain ; and this can only be done by elevating the depressed parts, removing the loose and fractured, and cautiously freeing the dura mater from any coagulated blood, or other extraneous bodies, whether lying loose, or forced into the brain itself ; all which can be easily accomplished, provided the apertures made by the trepan are sufficiently large. The sore must then be dressed in the lightest and most easy manner possible ; all that is necessary being to apply a pledget of fine scraped lint, covered with a simple liniment made of oil and wax, to that part of the dura mater which is laid bare, either by the openings made by the trepan or otherwise ; after which the edges of the scalp are to be brought together, or nearly so, and another pledget, spread with an ointment of the same kind, laid along the whole course of the wound. A piece of fine soft linen is to be laid over all, and the dressings retained in their places by the most simple bandage we can contrive. This bandage may be a common night-cap, made to apply close to the head, by means of strings,

strings, which draw it together on the back part, and are tied on the forehead; and thus the dressings may be made to press more or less strongly at pleasure. When the patient is laid to bed, he must be placed in such a position as is best adapted for allowing the matter to flow out from the wound, which may be done most commodiously by placing him on the opposite side, reclining a little backwards, and supporting him in this way. If the operation is to be attended with success, the patient will soon begin to show signs of recovery, by the abatement of the symptoms. He will open his eyes, moan, and move himself a little. In a short time his eyes will be affected by the rays of light, he will begin to speak, though indistinctly; and, by degrees, all the original symptoms will disappear; after which the whole care of the surgeon should be directed to the keeping him as quiet as possible, and his belly gently open by proper laxatives, which ought always to be of the least nauseating kind, taking care also to avoid every thing that may irritate or inflame. His food ought likewise to be the most simple and light, and his drink of the most diluent kind; barley-water, acidulated with the marine acid, will be very proper. Should he complain of the wounded part being uneasy, an emollient poultice being laid over it, which ought to be renewed every six hours  
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at farthest. Thus, commonly, there will be a plentiful flow of matter, not only from the perforations, but from the whole surface of the dura mater exposed to the action of the dressings. Every time the wound is inspected, we must carefully cleanse the dura mater from any matter that lies upon it, by a bit of very fine soft and warm sponge. Should any degree of sloughiness have taken place in the dura mater, or parts adjacent, it will thus be completely separated, and granulations will begin to form upon it, which will continue to increase until the whole arise to a level with the surface of the cranium. The edges of the fore are now to be dressed with straps spread with Turner's cerate, about half an inch broad, and the rest of the fore covered with soft and dry lint scraped fine, which is to be kept gently pressed on, by tying the strings of the cap somewhat firmly. Thus the cure will go on well, the too great luxuriance of the granulations will almost always be prevented, the parts will cicatrize kindly; and, as all the skin has been preserved in making the first incision, the cicatrix will be but little observed.

There are not, however, many instances of a cure being thus happily completed, and there are many accidents which too often render the success of this operation uncertain, even after there has been reason to entertain the most san-

guine hopes of a cure. Sometimes, in a few hours after the operation has been performed, the patient will be seized with a kind of restlessness, tossing his arms, and endeavouring to move himself in bed, while at the same time the oppression, arising from a compressed brain, continues much the same as before. In this case, especially if the pulse is quick and strong, we are to consider the complaint as arising from an overfulness of the vessels, and tendency to inflammation in the brain, and blood-letting is to be freely used. Sometimes, though the trepan has been applied successfully, the symptoms are not relieved, on account of a quantity of extravasated blood or serum collected between the dura and pia mater, between the pia mater and brain, or even in the substance of the brain itself. The danger of the patient, in these cases, is always in proportion to the deepness of the collection; greater when this is situated between the pia mater and brain than between the dura and pia mater; and greatest of all when in the substance of the brain itself. It will always therefore be a matter of the utmost importance to examine the state of the dura mater as accurately as possible after the operation has been performed. If blood be extravasated below it, this membrane will be found very tense, dark-coloured, elastic, and even livid; in which  
case

case there is no other method of relieving the patient, or indeed of preventing his certain destruction, than by opening it to discharge the extravasated fluid. It is evident, that, in doing this, the utmost caution must be used; as, by a very slight wound in the brain itself, life might be instantly destroyed. The safest method is to scratch very gently with the point of a scalpel; and, as soon as the opening is made, introduce the point of the open director, and cut upon it until you have enlarged the orifice as far as is necessary, which may sometimes be required fully as much as the extent of the perforated bone, or a crucial incision may be even in some cases required, and the corners thus formed cut off entirely. Indeed, in all cases where any collection of this kind is suspected, we must enlarge the orifice to a sufficient size, or the patient will reap no benefit from it. We have no reason to dread any dangerous hæmorrhage from the flux of blood which might ensue; and, though it must be owned that few patients have recovered in whom the dura mater has been perforated, yet we are to attribute this rather to the injury otherwise done to the brain, than to this operation. By taking off the pressure of the dura mater from any part of the brain, the latter is apt to protrude there; but even this is not to be dreaded equally with allowing it to be compressed

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fed by any extravasated fluid; and there are instances where the brain has been forced out through a fracture of the skull in considerable quantity, and yet the patient recovered; though the event in such cases must always be very precarious.

One of the most troublesome and alarming symptoms attending injuries of the head, where the skull has been perforated, is the appearance of those tumors called *fungi*, supposed to be excrescences of the brain itself, but which in truth are only excrescences arising from too luxuriant a growth of the new granulations which proceed from the sides of the perforated bone, or from the dura mater. Various methods of removing them have been proposed; such as escharotics, or even strong caustic, ligature, or excision. In general, however, as the perforations of the bone fill up, these tumors drop off; and it will always be prudent to wait till it can be determined whether this is to happen or not; and if we find that there is no probability of their dropping off naturally, we may then have recourse to some artificial method of exterminating them; but, of all the methods that have been tried, compression is certainly the worst. The reason of this is, that no compression can be applied to the tumor, without affecting the brain itself; and hence a very slight degree of pressure

pressure upon one of these tumors will occasion sickness, headach, or still more dangerous symptoms. In many cases they have little sensibility, and then only can we meddle with them; for, in other cases, they are so exquisitely sensible that they cannot be touched. Where any remedy can be applied, it will be proper to touch the tumor with lunar caustic; and in some cases, where it adheres only by a small neck, we may put a ligature around it, which being gradually tightened, and the circulation destroyed, will soon make the tumor drop off.

Thus we may commonly cure all those injuries of the head where the art of surgery is capable of giving relief; but it too frequently happens that such a degree of concussion has taken place, that no assistance from the trepan can be of any avail. The effects of concussion are, however, totally different from those of compression of the brain, and to be removed by means not only different but opposite, of which we shall afterwards treat. On this subject it seems only necessary to add farther, that, though the cicatrix left will be but small, when care has been taken to preserve the integuments, yet, when, either accidentally or otherwise, a large portion of them has been removed, they are never found to be regenerated, but the bone is left covered by a cuticle, or perhaps a very thin  
portion

portion of cellular substance. Such people ought to wear a piece of lead or tin lined with flannel over the weak place, in order to prevent the bad effects of cold, which might prove very injurious.

## SECTION V.

### *CASES OF COMPRESSED BRAIN, IN WHICH THE TREPAN WAS NOT APPLIED.*

J. R. a boy of fourteen, apprentice to a book-binder, was struck, by one of his companions on the left-side of the head, near the temple, with an instrument used for polishing books, with a small round head. He did not fall down, but felt excessive pain immediately after the stroke, and continued, for an hour and an half, to go on with the work he was doing. In about two hours after the accident, as the pain continued to increase, I was sent for. Not the least mark of external injury could be perceived; but the place where he said he was struck appeared to me to be just where the point of the left parietal bone is connected with the temporal, sphenoidal, and frontal bones, or nearly so. When I saw him, he was still able to go about, but he complained that the pain of his



his head was greatly augmented by pressure; his pulse was also remarkably slow, beating only sixty strokes in a minute, but full and regular in its contractions. Supposing the matter to be only a violent bruise received on the temporal muscle, I ordered twelve leeches to be immediately applied to his temple, upon the place where he had got the stroke, but without any relief. In an hour after his pulse beat only forty strokes in a minute, and he still complained very much of the pain, though still able to sit up. Such a remarkable alteration in his pulse made me suspect some internal injury, and I immediately bled him; but, an hour after this, his pulse sunk to thirty in a minute, he appeared more oppressed, spoke little, and became sleepy. All his symptoms increased very rapidly, and exactly four hours and fifteen minutes from the time the injury was received, he expired, but without any apoplectic-symptoms. Five minutes before he died, his pulse beat only fifteen strokes in a minute. Even then the intervals were regular, and his breathing as free from any kind of oppression as it had been in health.

In this case the symptoms went on with such rapidity, that nothing could be done; and so uncommon an instance made me very attentive to the appearances which presented themselves on dissection. Next day I opened his head, and, on removing

removing the scalp in the usual manner, I found the dura mater separated from the left parietal bone for more than two-thirds of its whole extent. There was a great extravasation of blood between the skull and dura mater, and the blood was firmly coagulated. On farther examination, I found the dura mater also separated from the whole superior part of the os temporum, above the petrose process, from the posterior and lateral portion of the frontal bone, from the external canthus, to near the falx, and from the whole of the anterior and inferior part of the parietal bone, to near the lambdoidal suture, reaching upwards nearly half the extent of the parietal bone. The thickness of the coagulum at the bottom was somewhat more than one inch, decreasing gradually in every direction, as it spread from the wounded vessel, until the consistence or colour of it could hardly be perceived. From the inside I could easily distinguish a fracture and depression of that point of the parietal bone which joins the temporal, sphenoidal, and frontal bones, of a circular form; nearly of the shape, and about the same size with the head of the instrument by which the blow was given. A longitudinal fracture through the centre of it was likewise observed, running exactly in the groove of the os parietale, made by the arteria mediana duræ matris. On examining this fracture, we  
I found

found that the artery had been wounded by a large sharp spicula of bone driven into it near the middle, and by this the hæmorrhage which proved so fatal to the patient had been occasioned.

From this case, which is perhaps as remarkable as any on record, we see the extreme uncertainty in the signs which are commonly thought to indicate a compressed brain. Here we have the most violent of all injuries, fracture, depression, and a great degree of extravasation, without even bringing the patient to the ground. We are not, therefore, suddenly to conclude that the cranium is not injured, because the patient retains his senses, and shews no sign of apoplectic stertor; for both these and other symptoms may not appear, and yet a mortal injury be done to the brain; as, on the other hand, all of them may appear, and yet the brain have sustained no farther injury than what is called concussion. The only remarkable symptom in the present case, was the extreme slowness of the pulse; but there are not a sufficient number of examples recorded from which we can judge whether this be a sign of extravasation or not.

J. S. a boy of seven years of age, fell II.  
from the top of a stair of fourteen steps,  
and was taken up in a state of coma, with a division of the scalp on the right parietal bone, running

ning in the direction of the fibres of the occipito frontatis muscle. Having laid the bone bare for about an inch, I found a very evident depression, about an inch in diameter, but without the least appearance of fracture; and, as the violent symptoms had abated, I thought it most prudent to wait for a short time. The wound was very superficially dressed with a pledget of soft ointment, the child put to bed, and an injection administered, which operated well. The symptoms of stupor continued very strong for some hours, but after that time gradually abated; and in twenty-four hours he opened his eyes, and began to complain of his head. His pulse being increased in strength, as well as in frequency, I applied six leeches to the temple, which discharged freely. The stupor, however, still continued in a considerable degree, and, on the third day, he vomited twice severely; his pulse being 112, full and hard. Five ounces of blood were taken from his arm, by which he was much relieved; his injection was repeated, and at bed-time he had a bolus of three grains of calomel, with fifteen of conserve of roses, with a cup of senna tea in the morning. By this he was farther relieved, though his eyes continued very dull and heavy, and the pupils much dilated, but without any vomiting. Leeches were again applied; and he now began to take  
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some light food, without sickness ; and he slept also more quietly, with less starting and snoring than hitherto. On the fifth day the symptoms of compression were almost entirely gone ; but, as his pulse was still hard and quick, six ounces more of blood were taken from his arm, by which the oppression on his eyes, as well as the hardness and quickness of his pulse, was greatly abated. His bolus was repeated at night. Next day the depressed part of the bone seemed to be considerably elevated, and healthy red granulations appeared every where to shoot up from the surface of the denuded part ; his eyes looked much better, and he had slept six hours without the least oppression. In three days more the depressed part of the bone appeared to be completely elevated, though there was still a hardness and fulness of the pulse. Eight ounces more of blood were taken, and his laxative was repeated. By this the headach was almost entirely removed, and his pulse became much better than it had ever been since the injury. In two days, however, he began to complain of pain under the denuded part of the bone, his skin became hot, his pulse rose to 108, and became hard. Ten ounces of blood were taken from the jugular vein, and his laxative repeated at night, which operated well. As his skin still continued hot, three grains of Dover's powder  
were

were given every hour for four times successively. By this he sweated profusely for twelve hours, with great relief of every symptom; from this time he continued to regain his health, and, in a month from the time of receiving the injury, was completely cured, and has continued well ever since, which is now five years.

From this case we see that there is not always any occasion for trepanning where the skull is depressed, and that nature hath endowed this bone with a power of rising up of itself; whether this be effected by the natural elasticity of its fibres, or by the gradual action and pressure of the arteries of the dura mater, though, whatever be the cause, it is probable that such elevations will happen more frequently in young than in old subjects. In like manner the cranium, like other bones, has power to unite itself, by a callus, when fractured; and no doubt frequently does so when fissured or fractured. The necessity for trepanning, therefore, does not arise merely from the skull being depressed or fractured, but from the brain being compressed, and no possibility of otherwise removing the pressure. In like manner, even though some quantity of liquid should be extravasated within the cranium, there is a possibility that it may be absorbed there as well as in other parts of the body; the necessity for performing the operation

tion of the trepan, therefore, does not arise from mere extravasation, more than either of the other causes simply considered, but entirely from the injury done to the brain by compressing it; and, if we can, by any internal remedy, promote the absorption, we may also cure the patient, without running the additional risk incurred by the operation. But, when these remedies are found to be ineffectual, we are then, at all events, to proceed, provided we can by any means discover a place where the instrument ought probably to be applied rather than another.

A. M. a female of six years and an half, fell from a table upon the left-side of the frontal bone, immediately above the origin of the temporal muscle, by which a pretty large wound was made in the scalp, with an evident depression of the skull for more than half an inch in diameter. About eight hours after the accident I was called, and found the child comatose, the pulse about eighty strokes in a minute, and she had vomited several times. The wound was dressed with charpee; and, as she had lost a considerable quantity of blood, I did not apply leeches, but contented myself with giving an injection, which operated well. The pupils of the eyes at this time contracted by the light as usual;

fual; and, in twenty-four hours after the accident, she seemed to be tolerably recovered; having during that time taken a few spoonfuls of panada, and some barley gruel, without any sickness or vomiting. For sixteen days matters went on in a way very similar to the former case; but, on the sixteenth day, she was seized with chillness and shivering, which, in a short time, was succeeded by heat and restlessness, attended with a quick and hard pulse. Ten ounces of blood were instantly taken from the jugular vein, and, as the wound now began to have a bad aspect, an emollient poultice was applied over it; an ounce of diaphoretic mixture was given every second hour till she should perspire freely. Next day the symptoms were considerably relieved; but, as the pulse still continued full, and upwards of an hundred in a minute, she was again let blood in the arm to about six ounces, and the injection repeated. By these medicines the headach was almost entirely removed, and the other symptoms of fever greatly abated; the matter discharged from the wound also became more copious, and of a better quality. In twenty days from the accident, every symptom of fever appeared to be totally removed, and, in a month, the depression was completely elevated, as in the former case; the patient was perfectly



fectly cured, and has continued well for several years.

## SECTION VI.

*OF A CONCUSSION OF THE BRAIN.*

IT is not yet determined what the peculiar nature of this affection is, nor how the vital system is disordered by it. It takes place in all violent commotions of the body, whether the head be immediately affected by it or not. Violent falls of any kind produce it, even though the person happens to light upon his feet. In several cases of this kind that I have met with, all the symptoms formerly described, as arising from concussion of the brain, were occasioned by falls from horseback, from scaffolds, or other heights; and in none of all those was there any mark of external injury upon the head; the parts struck being either the head or shoulder, bottom or the feet. Symptoms of the same kind are produced by blows upon the stomach, or by excessive drunkenness. In the case of a blow upon the stomach, we can scarce suppose any inflammation of the brain; and indeed, in no case in which a person died of concussion, has there e-  
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ver been any thing like an inflammation discovered there by dissection, though the smallest trace of it would have been very obvious. So far from this, there is great reason to suppose that concussion and inflammation are direct opposites to one another. Inflammation, as we have already seen, consists in such a distension of some part of the vessels, that they are not able to propel the contained fluid, which yet continues to be more and more impacted into them by the pressure of the rest; and hence the action of the heart and arteries, meeting with resistance in the inflamed place, is greatly increased. In concussions, on the other hand, there seems to be a sudden cessation of the nervous influence, so that all the fluids instantly stop, and the person becomes like one dead. It cannot, however, be similar to a syncope from inanition, because it very often takes place where none of the vessels are ruptured; though it may in some degree resemble that from fear. But it most of all resembles the effect of a great stroke of electricity, which we know acts immediately upon the nervous system. To me it appears to be an injury done to the brain by making the basis of it strike against the corresponding part of the skull, which is very ragged and uneven, and may, by its action upon the whole contents of the cranium, (including the eighth pair of  
nerves

nerves which arise there), cause a collapse for a certain time, more or less detrimental, or of longer or shorter continuance, according to the nature of the injury. In cases of blows on the stomach, the effects evidently arise from the sympathy existing between the stomach, which is a very nervous part, and the brain, which is the origin and fountain of the nervous power altogether. But, be the cause what it will, it is most certain, that, in all cases of concussion, the cure ought to be directly opposite, or nearly so, to what it is in the inflammation of the brain. No remedy is more generally useful in cases of inflammation than blood-letting, and none more destructive in those of concussion, and that whether the patient be naturally full of blood or not. It too frequently happens, that people, after having drunk too freely, fall from their horses, and are taken up in a state of insensibility, so that we cannot tell whether the injury be occasioned by the fall, or by the liquor. In cases of this kind, the first thing to be done is to empty the stomach by an emetic. A solution of white vitriol is preferable either to Tartar emetic or ipecacuanha. A drachm of this, dissolved in a pound of water, may be used, and four ounces of this poured down the person's throat every fifteen minutes until it operates. By neglecting this, many have died in a few

VOL. II. Z hours

hours after the misfortune, though, upon dissection, not the smallest vestige of injury was met with on the brain, either externally or internally; and it is obvious, that, in cases of such extreme debility, general blood-letting can never be performed with safety.

Besides cleansing the stomach by an emetic, we ought, in recent cases of this kind, to stimulate the person's olfactory nerves by volatile salts, or rather the vapour of caustic spirits of sal ammoniac, which is much more powerful. Water should be dashed upon his extremities for a few minutes, after which he ought to be well dried, and whatever is given him ought to be of a stimulating quality. The purest stimulus I know is spirit of sal ammoniac; a tea-spoonful of this might be given mixed with a glass of water; his temples being also well chafed with it plain. Cordials are likewise of the utmost utility; but they ought always to be adapted to the constitution of the patient; i. e. they ought to be of the same nature with the liquor which he has been accustomed to drink, or rather a little stronger. A person, for example, who has been accustomed to drink malt liquor, might have wine; one who has been accustomed to wine, might have ardent spirits; and those who have been addicted to spirituous liquors, ought to have the same, only stronger than

than usual. I know that more attention ought to be bestowed upon this subject than practitioners have paid to it.

If, notwithstanding all our efforts, the stupor still continues, it may be proper to take away four ounces of blood by the cupping glass. Stimulating injections, particularly those made of turpentine and the yolk of an egg, are very useful, and repeated according to the urgency of the symptoms. A gentle laxative should also be given as soon as the patient can swallow; and it may be repeated according to the urgency of the symptoms. Gentle diaphoretics will also be found very useful. If still the patient be not relieved, a blister to the top of the head will sometimes be found very effectual. After the first discharge, it may be kept open for any length of time you please, by the use of issue ointment. Thus the patient will sometimes recover pretty quickly, and be able to take his usual exercise; but, should he still continue languid and feeble, with some degree of loss of memory, tonic medicines, such as bark, steel, colomba, valerian, the shower-bath with sea water, if it can be had, instead of fresh, may be used. Opiates I have always found detrimental in the early stage of the distemper; and indeed the young practitioner ought to be cautious in giving too great quantities of wine, spiritous liquors, or other  
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strong cordials, as thus he may sometimes do hurt instead of good.

In cases of this kind, though I have advised the use of a vomit in the first place, yet that is only where the stomach is loaded; and here I always found it of great utility. In others, gentle purging and blistering were found very serviceable; but, should the issue put on the top of the head, as above recommended, be found too troublesome, and the intellectual faculties continue impaired, a seton may be applied to the neck with great advantage.

### CHAP. XIII.

#### *OF DISEASES OF THE EYES.*

THE eyes are subject to various disorders, arising from their peculiar and delicate structure; and, for the better understanding of those to which they are subject, we shall here give a short account of their structure and anatomy.

The orbits are formed by the union of the os frontis with several other bones of the face, of which that named the os unguis is the most remarkable, as being frequently the subject of a surgical operation. It is the thinnest and  
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most easily perforated of any bone in the body, being in truth not thicker than fine paper, so that the fine point of an instrument may easily pass through it. It consists of two hollow pieces with a ridge in the middle; the latter forming the boundary of the orbit at the internal canthus of the eye; one of the depressions forming the very point or angle of the orbit, and the other serving as a lodgement for the lachrymal sac; protecting also the duct which conducts the moisture from this sac into the nose. The lachrymal duct is about the size of a crow quill, except about its extremity, where it perforates the membrane of the nose; and here, like the opening of the ureters into the bladder, it is found contracted to a very narrow point.

The globe of the eye consists of three coats, inclosing liquids of different consistencies and colours. They are in general named the sclerotica, the choroides, and the retina. The first is the outermost, including the whole eye. It is transparent on the fore-part, but white and opaque every where else. Hence, different parts of it have received different names; the transparent part being named cornea, internally it is lined by the choroides, a dark coloured membrane, which adheres every where strongly to it, and the forepart of which, joining with the sclerotica, forms a kind of septum, or vari-  
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ously coloured curtain, named, from its different colours, the iris. This is furnished with a great number of straight fibres, which appear to be endowed with a power of contracting and elongating themselves longitudinally; in the middle is a circular opening called the pupil, which, by means of this contraction and dilatation, becomes more or less dilated, to regulate the quantity of light to be admitted to the optic nerve. The most internal coat of the eye is the retina, a white membrane, supposed to be an expansion of the optic nerve, which lines all the back part of it, and, as far as we can judge, is the immediate organ of vision. There are three kinds of substances, all of them called *humours*, though one of them is a solid body, another a gelly, and only one has a fluidity like water. The most fluid, called the *aqueous* humour, is situated directly under the cornea, and lies between it and the crystalline lens, improperly called the crystalline *humour*; and behind this is the gelly, called the *vitreous* humour, which occupies all the posterior part of the internal cavity. It is unnecessary to enter into any account of the manner in which the rays of light are refracted, and the images of objects formed by means of their different densities; but we must observe, that besides the coats already mentioned, there are two others, though not properly belonging



longing to it, which yet have a very considerable share in the affections of it. These are named the *albuginea*, and the *conjunctiva*, or *adnata*; the former being a tendinous expansion of the muscles, and the latter a reflection of the membrane which covers the inside of the eyelids.

The moisture requisite for keeping the eye moist in its constant motion, is supplied in a great measure by the glandula lachrymalis, seated in the depression of the os frontis near the external angle of the eye. By this gland it is probable that the tears are mostly secreted; though it has been thought that the caruncula lachrymalis, a small red body situated in the internal angle of the eye, was their principal origin. It doth not, however, appear that this body is of a glandular nature at all; and there is reason to suppose that a great part of this fluid is made up of what exudes from the surface of the eye, and membrane of the eyelids. The blood-vessels of the eyes are but small, and therefore there can never be any danger of an hæmorrhage from them in operating upon this organ, even when we are obliged to extract the ball itself, which is the most melancholy and dangerous of all that can be performed on the eyes. Like other parts of the body, they are subject to inflammation, which may arise from various

various causes, and of which we shall now treat.

## SECTION I.

### *OF OPHTHALMIA, OR INFLAMMATION OF THE EYES.*

AN inflammation most commonly arises in the external coats of the eye called the albuginea, or adnata, &c. but may also affect the retina itself; in which latter case the sight is much more dangerously affected than in the other. Inflammations of the eyes generally show themselves, first, by an uncommon and plentiful effusion of tears, which soon acquire such a degree of acrimony as is sufficient to excoriate the parts on which they fall. After the disease has continued for some time, a yellow purulent kind of matter is mixed with them in considerable quantity. As the malady still continues to advance, the eyelids become affected, and a viscid glutinous humour is secreted from their edges, which unites them strongly together while the patient sleeps, and still increases the inflammation. The disease is attended with pain all over the surface, and a sensation as if sand or some extraneous substances lay between the  
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Fig. 6.

Fig. 4.

Fig. 9.

Fig. 1.

Fig. 2.

Fig. 1.

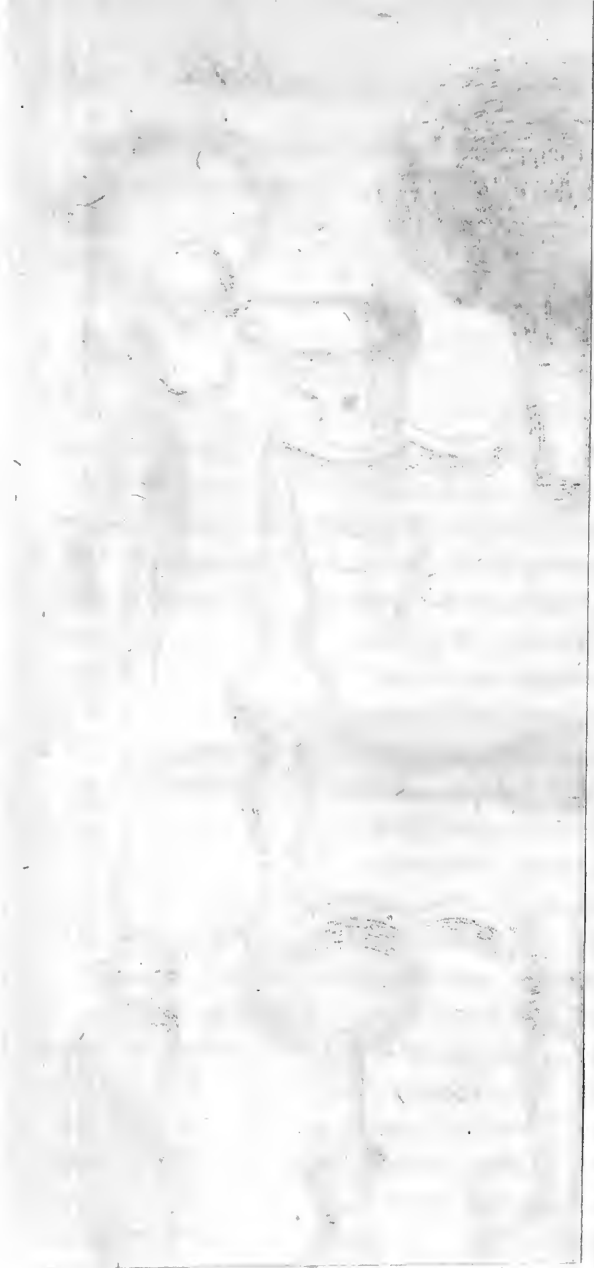
Fig. 3.

Fig. 5.

Fig. 8.

Fig. 7.





the ball and the eyelids. The symptoms are increased by the motion of the eyes, or by light ; and in proportion as the pain is augmented by exposure to the latter, we have more or less reason to suppose that the retina is affected. If the disease continues violent, notwithstanding the application of all the remedies we can think of, the inflammation will end in the same manner as similar affections in other parts of the body, *viz.* suppuration or gangrene. Indeed, where the symptoms run high, the whole of the membranes of the eye affected, and the admission of light attended with great pain, we generally find the pulse quick and full, along with all the other symptoms of fever. When these violent symptoms continue for some time, there is danger of a suppuration of the whole ball of the eye ; and when this takes place, the abscess points at the transparent cornea, and the eye sinks, or the cornea may become opaque. It is but seldom that inflammation of the eyes terminates in mortification ; nevertheless I have met with one instance, in which the ball of the eye was affected by an erysipelas, which, in spite of every application, terminated in a complete sphacelus of all the coats of the eye. The disease appeared to have penetrated to the brain, as the patient died in twenty-four hours after, with every symptom of syncope.

Inflammations of the eyes may be brought on by causes both external and internal. They are often occasioned by sand, dust, &c. getting between the ball and eyelids, or by sparks from a smith's forge, or a mason's iron when cutting a stone; accidents which not unfrequently happens. The external cause is generally scrophula, though any other which induces a violent inflammatory disposition of the system may exert its effects, particularly upon the eyes; and indeed, most of these disorders do produce a greater or lesser degree of inflammation in this organ. The remedies in both cases must be determined by the causes which produced the disease.

Where an inflammation in the adnata is occasioned by any extraneous body introduced between the eyelids and balls of the eyes, the first thing to be attempted is to extract them. For this purpose the patient is to be placed in a chair, in a proper light, while the surgeon, opening first the under eyelid, by pulling it out and downwards with the fore-finger and thumb of the left-hand. By causing the patient move the eye, while the eyelid remains in such a position, it will easily be seen whether there are any particles of sand in it or not; and, if there is any, it may be removed by means of a probe, having a little fine lint, or a bit of linen-rag rolled round it. The upper eyelid is next to be pulled upwards and  
outwards

outwards as directed for the under one ; and, by turning the ball downwards, it will be seen whether or not there is any sand upon the upper part. Thus the dust, or any extraneous body which lies loosely upon the eyeball, may be readily extracted ; but, if a spark from red hot iron happen to have struck it, there will be more difficulty. In this case, the small metallic particle sticks upon that part of the eye which it touches, generally the lucid cornea ; but, if it happens to be in any part not easily visible, the least painful mode of removing it will be by making a quill in the form of a tooth-pick, and scraping it extremely thin ; having then seated the patient in a proper light, the operator is to separate the eyelids with the fore and middle finger, so that we may have a full view of the substance. With the thin edge of the tooth-pick, move it gently backward and forward, until it be entirely loosened from the eye, and then, by turning the thin edge of the quill betwixt the metal, now loose, and the tunica adnata, it may be taken out altogether. Even when this is done, however, it will frequently happen that the uneasy sensation will still remain, after the particle is totally removed ; and, when this happens to be the case, we will generally find that a very small wound has been made in the cornea, which must be healed before

fore the patient can get well. The eye must then be carefully covered up from the light, and a poultice applied to it of the crumbs of bread and solution of saccharum saturni, a drachm of the salt to a pound of water, with the addition of a little vinegar. With this the poultice is to be kept constantly moist, and in the morning a laxative of the saline kind may be given. Half a dozen of leeches may be applied to the temples if the pain continues. I have met with many cases of this kind, none of which resisted the treatment just mentioned above for four days; though, in several of them, the sight was not perfectly restored for several weeks; but, during all this time, the patient never complained of any pain or inflammation.

If, upon examining the eye, no scratch should be perceived, and yet the pain should continue, we may wash it with a little warm water, or with milk and water. This may either be injected by means of a small pewter syringe, or with a small bag made of elastic gum, mounted as represented Pl. 4. Fig. 1. The eyelids may be kept open, as already directed, when examining it for sand, and the water must be played pretty forcibly round the whole ball of the eye, by which means every particle will be completely washed off. Another method is by an eye-cup properly fitted to the eye, and filled with the liquid,



quid, when, by opening the eyelids, we may completely wash the ball from every particle of offending matter. Thus, any astringent wash may be most easily and readily applied, and the parts will soon recover their natural tone, by which the sight will in a little time be completely restored.

Inflammations of the eyes, occasioned by any extraneous body, may be always removed without difficulty, provided the constitution be otherwise sound, either by the method already mentioned, or by other antiphlogistic remedies. Where the poultices, &c. have failed, blood may be drawn by cupping and scarifying, never less than six or eight ounces being taken away at a time, and the evacuation must be repeated according to circumstances. There is scarce any complaint, in which brisk purging may be used more advantageously than here; and a purgative may be given with good effect every third day. In all cases we must exclude the light entirely. Should the disease, however, still continue, and the inflammation tend to a point on the adnata, or any part of the ball, the best way will be to cut the most turgid vessels with the knife represented Pl. 4. Fig. 2. The point, and flat side of this knife is to be pushed through below the tumified vessels; after which the back of the knife is to be turned towards  
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the tunica sclerotica, and the edge directly to the vessel. Thus we may completely and readily cut every vessel, whether large or small, without wounding the eye; and thus I have seen great relief given, when every other method had failed. It may be proper, however, while this operation is performing, to have an assistant to secure the patient's head, while the surgeon opens his eye with his fore and middle fingers.

Where the inflammation arises from an internal cause, or where any external injury happens to be exasperated by some fault of the constitution, the difficulty in accomplishing a cure will be much greater. Still, however, we must pursue the same plan. The indications are, to remove or diminish the pain; to take off the accumulation of blood in the vessels of the part, and to diminish the irritability. These may be accomplished by topical blood-letting, either from the vessels of the eye itself, or from the parts adjacent; and the nearer to the eye so much the better. Should this fail of the desired success, we may use opiates externally. I have frequently found great advantage from a few drops of laudanum, mixed with wine, and put into the eye, after the violence of the inflammation has somewhat abated. This is more effectual than the watery solution of opium, which

which is sometimes used for the same purpose. The pain attending an inflammation of the eyes is also frequently abated by shaving the head, and washing it often with cold water. Brisk purging is very effectual in the removal of all; blisters, issues, and setons, may be used with great advantage. One of the most troublesome symptoms in this disorder, is the great discharge of viscid glutinous matter from the tarfi or edges of the eyelids. This proceeds at first from the increased secretion, by the sebaceous glands situated there; but, when the disease has continued for a long time, the parts become ulcerated, and the discharge prodigiously increased. The best remedy I ever found in cases of this kind, was an ointment composed of one part of the unguentum citrinum, and one and a half of the simple cerate of the Edinburgh Pharmacopœia, or equal parts of quicksilver, and hog's lard well triturated. The former, however, appears to me to be preferable, as it not only heals the ulcers, but seems to have a good effect upon the ophthalmia itself. The ointment may be laid on with a pencil, anointing the tarfi from the internal to the external canthus of the eye, insinuating, at the same time, the pencil between them as before. We are likewise frequently to wash the parts with a weak saturnine solution, or one of white vitriol. After the inflammatory

tory affection is removed, however, the eyes frequently remain for a long time very tender, and incapable of bearing much light, for which reason they should be shaded with green cloth. The best preventative of any return of the disorder is the Peruvian bark.

## SECTION II.

### *OF ABSCESSSES IN THE EYES.*

IT has already been observed, that, as in other parts of the body, inflammations of the eyes may terminate in suppuration, or even gangrene. The suppuration may take place between the adnata and sclerotica, as well as on the lucid cornea ; and small inflammatory tumors, tending to suppuration, are frequently met with towards the external canthus ; and sometimes a suppuration takes place in the whole substance of the eye itself, and the sight is totally destroyed. This is apt to take place in long continued inflammations, which have resisted every kind of medical and chirurgical assistance. The humors turn opaque ; the cornea, from its weakness, becomes irregular in its appearance ; the whole ball of the eye, at the same time, putting on a  
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strange irregular figure, and full of protuberances. If the matter is not discharged by puncture, the abscess sometimes bursts, and discharges its contents naturally. Disorders of this kind have been named *staphyloma*; but, where the matter is collected between the coats of the eye, as in the case of small pox, where it is collected between the adnata and-lucid cornea, upon any part of the sclerotic coat, or where, by any accident, a small quantity is formed behind the cornea, or a drop of blood happens to be lodged there, or behind the under part of the iris, it is named *hypopyon*.

When this disease arises from the small pox, it is easily known, even where it is so extensive as to cover the whole of the transparent cornea, and so prominent as to impair the motion of the eye, because it has not been preceded by pain and other inflammatory symptoms. Even when it has arisen from severe inflammation, if a deposition of matter takes place in the lucid cornea, or in any other part of the ball of the eye, it continues nearly stationary, and is never known to increase to such a size as to burst and discharge itself. In the *staphyloma*, as the sight can never be recovered, if the violence of the pain still continues, and the inflammatory symptoms increase, notwithstanding the exhibition of every remedy, we must treat the disease exactly

as we would an abscess in any other part of the body. We are now to consider of the most proper place for making the opening ; which, in this, as in every other suppurated tumor, ought to be the most dependent. The incision, therefore, should be made in the under part of the eye, where the cornea joins with the sclerotic coat. The patient must be placed in a chair of a proper height, and his head secured by an assistant. The surgeon then, with the fore and middle fingers of the left-hand, separates the eyelids to a sufficient distance. He then introduces the point of the knife, represented Pl. 4. Fig. 3. at the most dependent part of the tumor, entering it about two lines from the edge of the junction of the tunica sclerotica with the cornea, passing it in a straight line across to the opposite side, where the point of the knife is to be pushed out, which, from its shape, will now have separated the whole of the under part of the cornea ; and thus the contents of the eye, at least such as are suppurated, will now be discharged. It is now to be covered up, with a compress dipped in a weak solution of sugar of lead in rosewater, and gently laid on. The inflammatory symptoms are to be abated by the remedies already directed under the head of inflammation. Thus, the tumor of the eye will be entirely removed, and the pain, if merely the consequence of suppuration,

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tion, will go off in a few days. There are, however, some cases of staphyloma, in which there is either little or no enlargement of the ball of the eye, although the humours, iris, and cornea, are become quite opaque, or where the bulk of the eye is diminished. Both of these cases are entirely free from pain; loss of sight being the only thing for which the surgeon is consulted, but in neither of them can he give any assistance.

The only species of hypopyon I have ever met with, or which I believe has any existence, is that which follows the small pox. In it the matter is collected upon the globe of the eye, and between its coats. As soon as it is observed, after the small pox has begun to go off, the operation is to be performed. The child must be laid upon the knee of an assistant, in a clear light, and the eyelid properly secured. In cases of this kind, it is always necessary to fix the eye; the best instrument for doing this is called an *hasta*, and represented Pl. 4. Fig. 4. The point of this is to be stuck into the sclerotic coat, about a quarter of an inch from the transparent cornea. The surgeon is then to pass a lancet-pointed knife represented Pl. 4. Fig. 3. very cautiously through the under part of the abscess near its middle, and passing it out at the opposite side, the under part of the adnata will thus  
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be completely separated, and the matter, which is still in a fluid state, will be discharged, and, if the lucid cornea be not affected, the sight may still be preserved.

Should the matter, by proceeding in the manner just directed, not be evacuated, it may even be proper to give the *hauta* to an assistant, after the surgeon has opened the under part of the tumor, that the eye may be kept in its former position, while he, taking a pair of fine forceps in his left-hand, and a pair of small probe-pointed scissors in his right, Pl. 4. Fig. 5. separates the pellicle that covers the anterior part of the tumor. After the operation is finished, the eye must be gently shut, and covered with a small compress wetted with a solution of sugar of lead, and care must be taken to keep this compress constantly moist with the solution, that any symptoms of inflammation which otherwise might occur may be prevented as much as possible. The bowels are to be kept open, and the diet ought to be of the most antiphlogistic and cooling kind. Thus there have been several instances of sight being restored, but the cases were all recent.

Where fluid matter, or blood, is lodged within the cornea, the opening must be made on the under part, as in the extraction of the lens hereafter to be mentioned, with this difference only,



only, that in cases of this kind, the opening does not require to be so large as for the extraction of the lens. The patient must be treated in the manner already directed, and if proper care be taken, there is a probability of recovering the sight; particularly where there has been an extravasation of blood.

It has already been observed, that small tumors of an inflammatory nature frequently take place near the internal angle of the eye, which sometimes come to suppuration. It has, however, been doubted by some practitioners, whether they ought not, in all cases, to be resolved by means of proper applications, rather than allowed to suppurate. But the reasons alledged for this practice do not seem to be altogether well founded; and here, as in all other parts of the body, whenever there is a probability that the tumor will not readily be dissolved, it ought by all means to be brought forward to suppuration. The means to be employed for this purpose are the same as in any other part of the body, viz. emollient poultices; and when, by their means, a kindly suppuration takes place, the matter being fully discharged, all danger is prevented of the formation of any tumors of a harder nature, which sometimes infest the eyes in consequence of affections of this kind. When the contents of such tumors are discharged, it will  
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be proper to bathe the parts with a weak solution of saccharum saturni, or some other astringent solution, that the parts may recover their tone.

### SECTION III.

*OF THE DROPSY OF THE EYE, WARTS, WENS, STEATOMATOUS TUMORS, &c. ON THE EYELIDS, AND GLOBE OF THE EYE.*

THE eye, as well as other parts of the body, is sometimes affected with an hydropic disorder, arising frequently from an accumulation of the aqueous humour. It begins with a sensation of fulness and tightness in the ball of the eye, attended with dimness of sight, the complaint increasing gradually, till vision is entirely destroyed, or very much impaired. As the disease increases, the ball of the eye is greatly enlarged, until at last it begins to lose its natural appearance, and a protusion takes place at the cornea, where it is least capable of making any resistance. When matters have proceeded this length, vision is totally destroyed, and, if the disease is left to itself, the cornea bursts, and the eye empties itself.

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Though this distemper has frequently been confounded with the staphyloma, yet it can never be mistaken for it by any observer in the least attentive, even in the very first stages; for, in the dropfy of the eye, the patient is always sensible to the light, even to the very last stages; but never in the staphyloma, even from the very first. It is easy indeed to see that this must be the case where there is any mixture of pus; as it is the nature of this fluid to be opaque; whereas, in all hydropical swellings, the liquid is clear and transparent.

The only thing that can be done in a dropfy of the eye, is to evacuate the humour; and, if this be accomplished in time, there is a possibility of preserving the sight, which cannot be done if the disease be allowed to proceed; for then it is totally destroyed by the mere distension of the parts, independent of any other cause. If the operation be performed, however, in proper time, too great a secretion of the aqueous humour may in future be prevented by the slight inflammation which generally takes place, and thus the sight may be preserved; or, at any rate, our intention of emptying the eye will be answered.

When this operation is to be performed, the patient must be seated in a chair, in a proper light, his head supported by an assistant, who is  
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also, with his right-hand, to keep the eyelid firm, as in couching the cataract, to be hereafter mentioned. The surgeon, in the mean time, is to fix the under eyelid with his left, fore, and middle fingers, having a lancet-pointed knife in his hand, two tenths of an inch broad, a little convex on one side, and concave on the other ; with the concave side next himself. He then introduces the point behind the iris, at the under part of the eye, pushing in the blade till the wound is made as large as the broadest part of it. Thus from its concavity the whole of the water, especially from the posterior chamber of the eye, will instantly run off, and, by turning the patient's head a little backward, and pressing gently upon the cornea, it will be evacuated from the anterior chamber likewise. The opening ought never to be made in the cornea, and should never be less than two tenths of an inch in length. The eye ought to be dressed, after the operation, with a slight compress dipped in solution of sugar of lead ; and any excess of inflammation must be carefully avoided. After the patient has recovered the use of his eye in some measure, we ought to endeavour to restore the tone of the parts by astringent lotions, such as solution of allum in brandy and water, in such proportions as he is able to bear. It must be observed, however, that, where the cornea happens

happens to be diseased, we cannot, by any operation, restore the patient's sight; all that can be expected is to diminish the size of the eye, which may easily be done as above directed.

A disease of the cornea has been described by practical writers under the names of *pterygium*, and *onyx*. This is a kind of fleshy excrescence which takes place in the opaque cornea, and sometimes furrounds the whole tunica conjunctiva, and spreads in such a manner as to cover not only all the opaque cornea, but the transparent part also. These excrescences, as well as ulcers in the eye-ball, always destroy vision. They may arise occasionally from wounds, burns, lues venerea, or scrophula; but inflammation, terminating in suppuration, is always the immediate cause, as well as of specks or films of any kind upon the eye, and must be treated in the same manner, making proper allowance for circumstances. Sometimes we meet with a small tumor consisting of a congeries of inflamed vessels, sometimes near the inner canthus, at others in some of the inferior parts of the eye, near the junction of the lucid cornea to the external angle. This is also the consequence of an high degree of inflammation; and here, as in every other affection of the eye, blood-vessels may be traced, running from the eyelids to the affected spot. Indeed, in very high degrees of inflammation, the

adnata sometimes becomes so remarkably turgid, that it rises considerably higher than the cornea, appearing indeed to be nothing else than a congeries of vessels. In no species of this affection, however, do we find any vessels shooting from the inside of the ball of the eye, unless where the whole is destroyed; and in that case every part of the ball, as well as the cornea, may become the seat of an highly inflamed fungous swelling. Upon the cornea indeed, every small speck appears to be supplied with red vessels from the adnata; and these may always be traced from the eyelids, or for the most part from the angles of the eye, where they often appear to penetrate the cornea, though there is sometimes a possibility of removing them so effectually, that not a vestige of them shall remain. An inflamed spot, however, sometimes remains after the whole of the rest of the inflammation has subsided; and though this, at first, may be but of small extent, yet, by continually increasing, unless proper methods are taken to remove it, it will at last be apparently united with the sclerotic coat, although I have, even when matters were come this length, frequently been successful in removing it, and that when every astringent recommended by authors had been tried ineffectually. I used a solution of white vitriol in the proportion of from eight to twelve grains to an ounce of water;

water; two grains of corrosive sublimate dissolved in four ounces of water; aqua cupri ammoniaci, formerly aqua sapphirina; touching also every point of the part affected with blue vitriol very finely powdered, put on with a small hair pencil, letting it remain for two or three minutes, and then washing it off with another pencil dipped in water. I used also, morning and evening, an ointment composed of equal parts of unguentum citrinum and auxunge, well mixed, covering up the eye closely with a poultice made of the crumb of bread, and the solution of lead as directed.

By persevering in the use of these remedies, I have frequently been very successful in removing all the different affections of the adnata, which take place in consequence of inflammation, *viz.* the different kinds of films and specks; but in some few cases of this kind, where matter was deposited partly upon the sclerotic coat, and partly upon the cornea, sometimes near one angle, and sometimes near another, I have found the disease resist all kinds of remedies, both external and internal. In some cases also, the whole eye has obstinately retained its inflamed and tumefied appearance. This affection is by some authors called *pannus*, the former *unguis*, or *pterygium*. In these I had at last recourse to dividing the blood-vessels which supplied the tumor. In doing this, the patient must be feated

ed on the floor, with his head turned back between the thighs of the surgeon. The under eyelid is to be fixed by an assistant as formerly directed, while the surgeon, at the same time, raising and fixing the upper eyelid with the fingers of his left-hand, or by means of the elevator represented Pl. 4. Fig. 6. cuts all the blood-vessels which supply the tumor with the knife represented Pl. 4. Fig. 2. passing the flat side of it below each vessel, and thus completely dividing it. This, indeed, is the surest and safest, as well as the most speedy way; for, if every blood-vessel is divided in this manner, it is evident that all communication with the tumor, by means of arteries, must be destroyed; at the same time, that there is not the smallest danger of wounding the coats of the eye, because the back of the knife, which is blunt, is turned towards them. After the operation, it will be proper to cover up the eye with a compress, moistened with solution of sugar of lead, and regularly applied. The belly is to be kept constantly open, and the food ought to be of the lightest kind. Thus, the sight will, in many cases, be restored, though it must be owned that sometimes, when the disease has been of long standing, the cornea may be hurt in such a manner, by the continuance of the inflammation,



tion, that the transparency may be lost beyond any possibility of recovery.

The eyelids are liable to tumors of four different kinds. *1<sup>st</sup>*, The hordeolum or styne; *2<sup>d</sup>*, Small soft pendulous tumor of the meliceris or wen kind; *3<sup>d</sup>*, Warts; *4<sup>th</sup>*, Small, round, hard, and elastic tumors, immediately below the skin, of a steatomatous or fatty nature. Of all these we shall now treat distinctly.

*1<sup>st</sup>*, The hordeolum or styne begins on either eyelid, near the puncta lachrymalia, with a sensation of stiffness, heat, and uneasiness; and, unless proper means be taken to prevent it, a tumor arises which always proceeds to suppuration. It seems to proceed from an obstruction in some of the sebaceous glands, or bulbs of the hairs, and may generally be removed, if not suffered to proceed too far at first, by anointing the part affected with Goulard's cerate three or four times a day; or, what I have found more effectual, a little of the citrine ointment, used morning and evening. If neither of these prove effectual, it will most probably suppurate. When there is an evident tendency to suppuration, it may be greatly promoted by a small emollient poultice. The little boil generally breaks of itself, and heals up immediately; but, if not, it may be opened with the point of a lancet. The only difference between this and  
any

any common abscess in other parts of the body, is, that the colour of the skin is not of such a deep red, during the inflammatory stage, as elsewhere, and that it proceeds more slowly to suppuration. This, however, is owing to its situation between the tarsus and internal cartilage of the eyelid, so that by the firmness of the latter, the skin which covers it cannot assume such a deep colour, as if no such body intervened. For the same reason, also, in all probability, the suppuration advances more slowly than in other parts.

2d and 3d, The wens, with which the eyelids are sometimes affected, generally have narrow necks, though in some cases it is otherwise. The warts are sometimes very hard, and not unfrequently have a narrow neck like the wens. The only remedy for either is extirpation. When the neck is narrow, the patient being properly seated in a good light, and the surgeon taking hold of the wen or wart, with one hand, or with a hook mentioned below, cuts its off with one stroke of the knife. As both of them, however, sometimes lie deeper than the skin, and the wen is always confined in a cyst, the operator ought by all means to extract the bag without wounding it, which may generally be done, by cautiously cutting the skin round the basis in a line with the surface of the eye; after

ter which, as the cyst is connected with the other parts only by very slender threads of cellular substance, a few slight touches of the scalpel will separate it entirely. The treatment of warts is exactly the same with that of wens; but, as the warts are more solid, the same caution is not absolutely necessary in removing them as in the wens.

4th, The steatomatous tumors which commonly affect the eye are seated immediately below the skin, and, when first observed, resemble a barley corn very much, both in shape and size. Sometimes the steatomatous tumors, as well as those of the meliceris and warty kind, grow to a great size, and, at certain times of life, or in particular constitutions, become exceedingly troublesome and dangerous. As soon, therefore, as they begin to increase rapidly, recourse is to be had to the knife. The patient is to be seated in a proper light, on a chair, with his head resting on the breast of an assistant. The surgeon, then, with a scalpel, cautiously divides the skin, from one end of the tumor to the other, dissecting it away, both from the one side below, and the other above the tumor, until it be entirely freed. He is then to lay hold of it with a dissecting hook, represented Pl. 4. Fig. 7. and raise it cautiously, dissecting it away from the cellular membrane, and parts below.

low. But, if the tumor should be of such a size that it cannot be easily laid hold of with the fingers, a ligature may be passed round its basis, or passed through it by means of a needle. The edges of the wound are then to be brought together, kept in their position by the twisted suture, and dressed as directed in other wounds.

#### SECTION IV.

##### *OF THE INCHIASIS, OR INVERSION OF THE CILIA.*

**I**N this disease the cilia are so much inverted, as to rub upon the ball of the eye itself, and create a very painful and dangerous inflammation. The most common cause is a derangement of the cilia of the upper eyelid, without any inversion of the tarsus at first. In this first stage, only one or two of the hairs are inverted; and, by pulling out these with a pair of forceps, and washing the eye with some astringent lotion, the disease may be immediately cured. Care, however, must be taken when they begin to grow again; and, if any of them appear to be inverted, they must be plucked out as before, or the patient himself may be taught to do it. In case, however, that this remedy should not be submitted

mitted to; on account of the pain attending it, it may be sufficient to turn the hairs upwards with a probe, and keep them for some time in their places, by means of a piece of adhesive plaster.

This is the only kind of *inchiastis* I have met with; but authors generally speak of an inversion of the tarsus itself, owing to a contraction of the muscle called the *orbicularis palpebrarum*. It appears to me, however, that no spasmodic affection of this muscle can at all produce the disease in question. The *orbicularis palpebrarum* arises, by a number of fleshy fibres, from the outer edge of the orbiter process of the superior maxillary bone, and from a tendon near the angle of the eye. These run a little downwards and outwards, over the upper part of the cheek, below the orbit, covering the under eyelid, and surrounding the external angle of the eye, being loosely connected only with the skin and fat. Then they run over the superciliary ridge of the *os frontis*, towards the inner cartus, when they intermix with those of the *occipito-frontalis*, and *corrugator supercilii*. Thence, covering the upper eyelid, they descend to the inner angle of the eye, opposite to the inferior origin of this muscle, and firmly adhering to the internal angular process of the *os frontis*, and to the short round tendon which serves to

fix the palpebræ and muscular fibres arising from it. It is inserted by a short round tendon into the nasal process of the superior maxillary bone, covering the anterior and upper part of the lachrymal sac, which tendon may be easily felt at the inner canthus of the eye. The use of the orbicularis palpebrarum is to shut the eye. It also covers the tarsi, which are two thin cartilages adapted to the shape of the ball of the eye; but, though the eye is shut by the meeting of these two, it is only the external edge of each that comes in contact with the other, the internal edges being always kept at some distance from each other. The muscle acts by drawing both eyelids close together, the fibres contracting from the outer to the inner angle of the eye; and thus the ball is squeezed, as well as the lachrymal gland, and the tears conveyed to the puncta lachrymalia. When the eyes are shut, the distance between the two internal edges of the tarsi allows the tears to pass into the puncta lachrymalia, so that there is no obstruction to them during the time of sleep.

Now, from an attentive consideration of what has just now been said, as the cilia grow out from the external edge of the cartilage, it will be evident that no spasmodic affection of the orbicularis palpebrarum can have the least tendency to draw them inwards upon the ball of the eye;

nay,

may, were such an affection to take place, the effect must be the reverse. By shutting one eye, and looking into a glass with the other, we may observe that the eyelids are shut in such a way, that the cilia are pressed away from the ball, rather than towards it, so that the external edge of the tarsus is turned more outwards than when the muscle is in a state of relaxation; and, of course, the cilia or eye-lashes are turned more outwards also. This being the case then, how is it possible, that any partial contraction of the muscle should have an effect directly opposite to that which is produced by a total contraction? Let any one try, by putting the muscle as much as he pleases in the way that it naturally contracts, and he will find it impossible to produce any thing like such an inversion as takes place in the disease we speak of. It might indeed be so, did the fleshy fibres of the muscle turn over the edge of the cilia, and pass up along the interior surface of the eyelid; but, as this is not the case, I must conclude that the case of *inchiastis*, assigned by the generality of authors, from a spasmodic affection of the *orbicularis palpebrarum* is entirely chimerical.

A cicatrix in some part of the eyelids is given as another cause of *inchiastis*; but what has been said concerning the spasm of the *orbicularis palpebrarum* is equally applicable to this. Had  
the

the wound been of great extent, it must have been attended with loss of substance or of skin; and consequently, by the contraction which always must take place in the healing up of a wound, the eyelid must rather have been drawn away, than any thing else. The disease, however, may take place, from an affection of the muscles in the following manner. As the levator palpebræ superioris arises from the superior part of the foramen opticum, above the levator oculi, near the trochlearis muscle, and is inserted by a broad thin tendon into the cartilage of the upper eyelid, named the tarsus; in a diseased state of that part of the orbicularis muscle, either by relaxation or palsy, the levator, by acting too strongly, may occasion an inversion of the tarsus, and thus bring on the disease. But, when it proceeds from this cause, we cannot then effect a cure by plucking out the hairs; it will perhaps be necessary to cut the muscle, and this must be done on the inside of the eyelid, and only partially; for, if it be cut entirely through, there is a possibility that the eye might remain constantly shut; though, even here, the *probability* is, that the muscular fibres would reunite, and the muscle again act, though less forcibly than before.

Where the inchiasis proceeds from a tumor, we must proceed as already directed for the extirpation



tirpation of tumors. If from a relaxation of the skin, by which the hairs are allowed to fall inward, and rub upon the eyeball, we must pull out the hairs, and then try to restore the tone of the parts by astringent lotions, such as solutions of alum in water, or rather strong infusions of oak-bark. Thus, the disease may, for the most part, be cured ; but if, as is sometimes the case, it happens to be the consequence of an anasarctous or dropical disposition, the water must be evacuated by puncturing the skin of the eyelid with a lancet ; after which, if the patient is not otherwise diseased, and the skin does not retract, we may remove such a portion of it with a scalpel, as is thought sufficient to take off the cause of the disorder ; and we are then to unite the lips of the wound by the twisted suture, as is directed in the chapter on sutures. But, in every case of this kind, the hairs should first be plucked out, that all obstacles to the cure may be removed as completely as possible.

These are the methods to be adopted in the cure of the disorder, which is frequently attended with such pain and other distressing symptoms, that some have directed the application of lunar or common caustics, of a red hot needle or wire ; nay, even the total destruction of the cartilaginous edge of the eyelid, from which the hairs grow ; but happily none of these violent remedies

remedies can ever be necessary. The disease commonly attacks the under eyelid, though sometimes also the upper one, and then it is commonly the effect of a dropfical tumor, which is to be removed in the manner already directed. It has, however, been recommended by many writers on surgery, particularly the French and Germans, to press the skin, by means of two brass plates and a screw, until the circulation was destroyed, and the part intended to be removed dropped off; but it is evident that this method has no advantage over the simple and less painful one of excision by the scalpel, as the vessels of the eyelid are so small that no hæmorrhage of any consequence can ever take place.

## SECTION V.

### OF THE ECTROPIUM, GAPING EYE, OR TURNING OUT OF THE EYELIDS.

THIS disease is just the reverse of the former. Like it, the under eyelid is most commonly affected, though sometimes the upper one; and in this case it is named *lagophthalmus*, from the supposed resemblance of the person's eye to that of a hare. In the ectropium, the cartilage of the under lid is so much inverted, that it cannot

cover the ball of the eye, though sometimes it is not averted, but only contracted. This contraction generally takes place in the under eyelid, though more frequently in the upper. Sometimes the disorder takes place without any other affection of the eye; at others it is accompanied with an inflammation or enlargement of the ball. It may be produced by the cicatrices of wounds, by ulcers, commonly of the scrophulous kind, by burns, the confluent small pox, or inflammatory swellings on the inside of the eyelid; but, as it most commonly takes place in old age, we thence conclude that it is the effect of debility.

When this disease is occasioned by the cicatrix of a wound, we must carefully ascertain the extent of it, placing the patient on a chair, in a proper light. His head must rest upon the breast of an assistant, who is to raise up the under eyelid as much as he can, while the surgeon, with his thumb and finger, placed a little below the cicatrix, gently pulls down the skin. He is then, with a scalpel, to cut the contracted part across, until the whole be completely divided; and, if any concretion has taken place between the muscular fibres and skin, the latter must be carefully dissected away till the eyelid return to its natural state, which it will do as soon as the obstruction is removed. The wound must be dressed  
slightly

slightly from the bottom with charpee, in order to make it fill up regularly, and to keep the eye steady; a small slip of adhesive plaster may be put over it to retain the eyelid in its proper place, and over all we apply a slight compress, kept on with a napkin tied round the head.

When an ectropium is occasioned by any inflammation and tumefaction of the internal surface of the under tarsus, the best method is to scarify the parts freely, either with a lancet, or small round edged scalpel, and to promote the flux of blood by bathing the wound with warm water, for a considerable time, and then applying a cataplasm made of the crumb of bread, and solution of saccharum saturni, to be repeated three times a day at least. To remove the inflammation entirely, we may repeat the scarifications, and use all the other means recommended in that chapter.

If any fleshy excrescence, upon the ball of the eye itself, or upon the internal surface of the eyelid, we must cure it by removing the tumor with the knife, which may be easily done in the manner directed in the last section. When it arises from the natural imbecility incident to old age, we can do nothing but apply astringent washes, which have sometimes been known to effect a cure, though, for the most part, they can only prevent the disease from growing worse.

Weak

Weak solutions of white vitriol, alum, or sugar of lead, are the strongest remedies that can with safety be applied in cases of this kind. The same method is to be pursued when the disease arises from relaxation from any cause whatever. When the disease is occasioned by the confluent small-pox, by scrophula, or by ulcers of any kind, the same method is to be followed as already directed in the case of cicatrix.

## SECTION VI.

### OF CONCRETIONS OF THE EYELIDS.

THESE sometimes take place in children before birth, or the lids may adhere together from an high degree of ophthalmia, as we find the lungs sometimes adhere to the pleura, in consequence of violent inflammation. Instances of this disease are but rare; however, when they do occur, the remedy is to separate the eyelids by means of a scalpel. We must in these cases carefully divide the upper from the under tarsus, extending the division from the internal to the external angle of the eye. The skin is first to be cut in this line, and then the scalpel to be still more cautiously introduced between the tarsi. When this is done, if the muscle, called the

*orbicularis palpebrarum*, has its natural form, the eye will open of course; and the only thing necessary to be done, is frequently to anoint the edges of the tarfi with oil olive, and cover up the eye slightly with a cloth moistened in the same, using, at the same time, all possible methods to prevent an inflammation.

In case any adhesion takes place between the eyelid and ball of the eye, it may, if recent, be removed, by pulling the eyelids gently outwards, and breaking the connecting fibres with a blunt probe, or any other instrument adapted to the purpose; but, if the disease has been of long standing, and the adhesions, of consequence, pretty strong, we must have recourse to the scalpel. The patient is to be seated as directed in the former section, with an assistant behind; if the under eyelid adheres, the patient must turn the ball of the eye upwards, and the assistant is to endeavour to keep it in that position. The surgeon is then to take a firm hold with his forefinger and thumb, of the skin and cellular substance of the under eyelid, just below the under edge of the tarsus; in which way, he is gently to pull the eyelid towards him. Thus, every adhesion may be distinctly seen, and easily separated by a skilful surgeon with a scalpel. The same method is to be followed when the adhesion takes place in the upper part of the eye,

eye, only the assistant must now take hold of the upper eyelid, and lift it from the ball, while the patient is desired to look downward. The surgeon must now cautiously divide every adhesion, till the eyelid is perfectly freed; and, when this is fully done, a few drops of fine oil are to be let fall into the eye, which is again to be shut, and covered gently with a pledget spread with Goulard's ointment. The oil is frequently to be applied, and every care taken to prevent inflammation or irritation.

## SECTION VII.

*OF SPECKS, OR FILMS ON THE EYE.*

THIS disease, by practical authors, called leucoma, albugo, or nubecula, consists in a kind of white speck, sometimes elevated above the surface of the eye, and sometimes not, which takes place on the cornea, or on the sclerotic coat. If on the latter, they seldom occasion much inconvenience; but on the cornea, a very slight degree of the disease may occasion a total loss of sight. They are in all cases the consequence of inflammation, and, in general, penetrate no deeper than the tunica adnata, though at times a very small abscess may be seen in them, which very readily bursting of itself, leaves an opaque spot

spot in the centre. It not unfrequently happens, that after an high degree of inflammation of the eyes, especially in scrophulous habits, several of these small specks may be discerned, so that the whole cornea becomes at last almost entirely covered with one opaque film. This, however, seems to proceed from the tunica adnata, which, during a long and severe inflammation, deposits a kind of serous matter upon the eye. In neither of these cases, however, is the cornea deeply affected; and therefore, by the use of proper remedies applied directly to the part affected, the disease may be removed. These medicines made use of in this case ought to be such as promote absorption, and tend to restore the tone of the vessels, as well as to remove the remainder of the inflammation which may yet exist. When a small abscess has taken place in any of the specks, you will always find a vessel or two running along the adnata, and entering it; but, when it is white, and a little elevated, though not purulent, it is possible that there may be no blood-vessels connected with it. Where any blood-vessel is perceived, it ought to be divided, if it is of any considerable size, and the eye bathed regularly three times a-day with solution of white vitriol, and speck upon the ball of the eye anointed with citrine ointment, as already directed.

Thus



Thus the most simple kind of speck will in general be easily removed; but where it has been of long standing, and is become very opaque, the following method must be used. The patient being seated in a proper light, having his eye fixed with an elevator, represented Pl. 4. Fig. 6. which employs the operator's left-hand, he is, with his right, to hold a piece of caustic, cut to a very small point, and with this to touch the very centre of the speck repeatedly, until the patient complains pretty much of the pain, when the eye is immediately to be washed with a pencil dipped in pure water, till all the pain of the caustic is gone. The eye is then to be covered up with a compress, moistened in solution of sugar of lead, and frequently changed. If no inflammation takes place, the application of caustic is to be repeated every second or third day; but, if any inflammatory symptoms appear, we must remove them by pretty smart purges, and cooling applications, leeches put on the temples, &c. Some of these remedies ought indeed to be used at any rate, in order to prevent any appearance of inflammation.

By a due perseverance in the use of these remedies, we may commonly remove every elevated white speck, without injuring the cornea in any degree; the disease, in nine cases out of ten, being situated between the adnata, and surface

face of the cornea. If the surgeon would wish rather to take it off by the scalpel, let the patient be seated, and his eye fixed in the manner already directed; then let the operator, with a round edged scalpel, cautiously divide the tumor on every part of its surface, until the membrane which surrounds it be totally destroyed. He is then to touch it with an hair pencil dipped in a solution of two grains of sublimate, in an ounce of rose water. The eye is to be shut up from the light as already directed, and the inflammation prevented by the methods formerly laid down. The pencil is to be used morning and evening, the application of it being continued each time till the patient complains; and, if the solution is not strong enough to give pain, another grain must be added. The unguentum citrinum will be found very useful after the first four days; it may also be applied with a pencil. Thus the speck will gradually diminish, and the patient generally recover his sight; but, it must be remembered, that this mode of treatment, by escharotic, or stimulant medicines, is only proper in one species of the disease, *viz.* when the speck rises above the surface of the eye. Where it is quite plain, the only method we can adopt is to treat the patient with mercurials, and brisk purgatives. This mode seems indeed to be naturally pointed out

out to us; for, we sometimes see that specks vanish without any applications, probably owing to the absorption of the matter effused between the coats of the cornea. On this principle, mercury may also cure the disease by increasing the absorption; but, in these cases, it is evident that very little dependence can be placed on external applications.

In the following cases which have fallen under my own observation, the truth of the doctrine and success of the practice above described and recommended will be sufficiently illustrated.

J. S. twenty-six years of age applied  
to me, on account of an opaque white  
spot on the under part of the lucid cornea, ex-  
tending from the internal to the external can-  
thus of the eye. By this spot, two thirds of the  
lucid cornea were covered, as well as an equal  
proportion of the pupil; in consequence of  
which, his sight was so much impaired, that he  
could perceive nothing in a line with his eye,  
or when the object was below him, though he  
could still see objects distinctly enough, provid-  
ed they were placed above him. The disease  
was a consequence of a violent inflammation,  
which took place after the measles, and continu-  
ed in both eyes for many months. When the  
pain abated, he found that with one eye he  
could

V.

could scarce perceive the light, and the other was totally blind; and continued so ever afterwards, the contents of the ball having been evacuated, after near nine months severe pain, and the eye becoming quite shrunk in the socket. The centre of the speck on the right eye appeared considerably elevated, and from this part a fine membranous film was extended over the whole lucid cornea, constituting the disease called by different authors *albugo*, *pterygium*, and *onyx*. It was supplied with blood by three different vessels, one rising from the external angle of the eye, passing across the tunica sclerotica to the speck, another from the internal angle, and the third arising from the under eyelid, to supply the corresponding part of the speck. When I saw him, he had no pain in his eye, nor had he had any for ten years before; though the complaint had, during the whole of that time, continued to increase. My first step then was to divide the vessels, by which the speck was supplied. I next applied a piece of linen, dipped in a solution of sugar of lead, and folded three or four times, and kept it on for twelve hours. Next I placed the patient on a chair, opposite to a window looking to the north; and having seated myself on his thighs, with a limb on each side, and an assistant behind, on whose breast the patient's head reclined, I opened his eyelids with

with the fore and middle fingers of my left-hand ; then, with a small sharp edged scalpel, I scratched the whole prominent surface of the speck, going over it afterwards with a bit of caustic sharpened at the end, till the patient began to complain of pain, and the tears flowed plentifully. With a pencil moistened in pure and cold water, I then washed off the caustic till the pain abated ; after which, the eye was covered up with the cloth, dipped in solution of lead as before. The room was kept very dark ; and in the morning he had a brisk purge of compound powder of jalap. The eye was kept constantly moist, and on the second day the dressings were removed ; but, as the pain was now rather more acute, six leeches were applied round the eye upon the cheek. As soon as the pain was entirely removed, the application of the caustic was renewed, and the purgative again exhibited. The patient was, for five weeks, confined to a dark room, the eye being constantly touched with caustic every third or fourth day, but never whilst any pain or inflammation remained ; and these were always carefully kept under by saturnine applications, laxatives, and a cooling regimen. Thus, by degrees, the thin film on the lucid cornea disappeared entirely, while the under part of it, which had been white and elevated, was likewise removed, until at last the

pupil was entirely freed, and he could distinctly see all objects, excepting such as were within four inches of his breast. The use of the caustic was now given up, and, in its stead, I used a little citrine ointment softened to such a degree, as readily to be laid on by an hair pencil; and, by the use of this, in six weeks more, the sight was completely restored, and has continued so for eight years past.

A. S. a stone-cutter, 36 years of age, VI.  
 got a spark in his eye from the iron while at work, which affected him in such a manner, that, in about a twelvemonth after the accident, a considerably prominent white speck was produced on the external edge of the lucid cornea, extending over almost one half of it, as well as the pupil. This speck was supplied with many small prominent vessels, some of them extending across the tumor and pupil also, losing themselves entirely at the internal angle and superior part of the eye, before they came to the sclerotic coat. As the eye bore the light with great difficulty, he was put into a dark room, and briskly purged, the eye being all the while covered with Goulard's ointment frequently removed. As he was otherwise strong and healthy, however, and the pain continued very troublesome, I took ten ounces of blood from his

his temples by cupping, but without discontinuing the ointment. In two days, the light became more tolerable, and I determined to perform the operation. Having then seated the patient and myself, as mentioned in the former case, I divided with the knife, represented Pl. 4. Fig. 2. all the red vessels, about the distance of an eighth of an inch from the edge of the lucid cornea, upon the sclerotica, thus promoting a free discharge of blood. The eye was then covered up as before, and the laxative repeated. In four days I again examined the eye, and found that he could bear the light without any pain, but could not perceive any object distinctly, by reason of a mist, as he said, which intercepted his view. On examining the speck with great attention, I perceived in the middle of it a very small black spot, at nearly an equal distance from the verge of the lucid cornea and pupil. Having then placed him properly, and opened the eyelids with the two fingers of my left-hand, pressing at the same time upon the ball, in such a manner, as to fix it firmly, I very cautiously touched this spot with the point of a common lancet, moving it gently from side to side, and thus soon brought away what I supposed to be a small spark of iron. I then made three or four small scratches on the surface, crossing them with others, and giving it at the same time

time a very slight touch of caustic, washing it off again as soon as he complained much of pain. The eye was once more covered up, and frequently bathed, with a solution of eight grains of vitriol, in an ounce of rose water ; his bowels being all the while kept open, and light carefully excluded from his room. The pain was quite abated in twenty-four hours ; and, in five days from the first application of the caustic, I again examined his eye. He now perceived objects more distinctly, and the centre of the speck seemed considerably thinner. I again touched the whole with caustic, covering up the eye, and treating it as before. I continued the same treatment for six weeks, during which time it was eight times touched with caustic, the speck all the while gradually decaying from the edges towards the centre, till nothing remained but a thin film. His sight became better in proportion to the decay of the film, and, by the use of the citrine ointment, as mentioned in the former case, he was perfectly recovered in the course of three months. A small opacity, however, still remained, for which the use of the ointment was continued for several months longer, by which, at length, the eye was rendered as perfectly whole as the other.

In a similar manner I treated a young girl of nine years of age, who had a pretty large elevated



vated speck on the cornea, next the external angle of the eye. It was supplied with a number of pretty large blood-vessels running along the sclerotic coat, but all of them arising from the angle of the eye. A very thin film likewise passed from the internal edge of the white speck across the pupil, which had also some red vessels. The disease was of six months duration, and had come on in consequence of an high degree of inflammation after the measles. I began with cutting the blood-vessels which supplied the speck, keeping the eye dark, and covered with cloths, moistened with solution of sugar of lead. In two days after, I cut the surface of the speck and the blood-vessels which remained, and, for three weeks regularly scratched the surface, touching it afterwards with strong citrine ointment, by means of an hair pencil, night and morning, keeping at the same time the eye constantly moist. Thus the speck gradually diminished; she went to the country, and, by the use of citrine ointment for some months, her sight was gradually restored.

## SECTION VIII.

*OF ULCERS IN THE GLOBE OF THE EYE.*

EVERY ulceration on this part of the body requires very particular attention, as the smallest cicatrix upon the transparent cornea is always attended with some degree of loss of sight. On the sclerotic coat, indeed, they are not of such dangerous consequence. If deep, however, they are, in all cases, to be dreaded, as they may thus occasion an evacuation of the aqueous or vitreous humour. Instances of this last kind of ulcers are indeed but rare, though they sometimes take place after wounds, or severe inflammations. Generally, however, such ulcers as destroy the coats of the eye, originate from some disease of the constitution, as scrophula, lues venerea, and, are in fact, the termination of inflammation by abscess and ulcer. The danger attending these complaints, it is evident, will be in proportion to the violence of the inflammation, and the nature of the part on which it is situated. Thus, if the ulcer is only in the opaque cornea, and does not penetrate deep enough to discharge the  
humour,

humour, the sight may possibly be saved, but, if on the transparent cornea, there is very little chance of its being so; and, in like manner, wherever it is situated, if deep enough to produce a discharge of the humours, there can be very little hope of a remedy.

In the treatment of ulcers of the eye, we must always keep in mind that they originally proceed from inflammation. Our plan, therefore, is to alleviate the inflammatory symptoms which already exist, and to prevent, as far as possible, any augmentation of them. If there is any reason to believe that they arise from a venereal taint, we must use such medicines of the mercurial kind as are best adapted to the age and constitution of the patient, the wound being constantly dressed with mercurial dressings; but such ulcers as commonly appear on the eye, where there is no defect in the constitution, seldom penetrate deep, but appear either as specs or films on the cornea or sclerotica, obstructing vision in some measure, according to the degree in which the coats of the eye are affected. Sometimes they appear to be general affections of the whole ball, ending in staphyloma, or in fleshy excrescences, termed by practitioners a cancerous state of the eye. In cases of this kind, I am of opinion, that all kinds of emollient poultices will rather be hurtful than otherwise,  
on

on account of their relaxing quality ; but, in every state of the complaint, it will be found useful to apply a cataplasm of crumb of bread, moistened in solution of sugar of lead, or cloths dipped in the same solution. If the ulcers are deep with honey-comb edges, discharging a thin acrid matter, they ought to be washed thrice a-day with a pencil, dipped in a solution of a grain and an half of corrosive sublimate in two ounce of rose-water. We may also use a leniment of spermaceti and olive oil to every two drachms, of which twelve grains of red precipitate are to be added, or, in some cases, fifteen grains of white vitriol may be used in its stead ; but, of all others, I have constantly found the citrine ointment, in the state recommended in the Edinburgh Pharmacopœia, to be the best application. Should the pain in the ulcer be very severe, we may use a liniment, composed of one drachm of saturnine ointment, and a solution of one grain of opium in a few drops of rose-water ; which, like the rest of the applications used in this disease, must be applied with an hair pencil, the eyelid being kept open till the liniment has produced its effect. Should any difficulty be met with in cicatrizing the sore, we may mix with a drachm and an half of the liniment fifteen grains of very finely powdered lapis calaminaris, or the same quantity of prepared tutty may be used,  
and

and the ointment applied as directed twice or thrice a-day. Astringent lotions may also be used with advantage. Solutions of five grains of alum to an ounce of water, or a mixture of one part of brandy with four of water, are as good as any.

When any fungous excrescence appears on the surface of the fore, we cannot expect a cure until it be totally removed. As soon, therefore, as it begins to arise, we must touch it carefully with caustic. Roman vitriol in very fine powder may be applied with the point of a hair pencil, and the application repeated twice or thrice a-day. Should this prove ineffectual, and the fungous still continue to increase, it may easily be removed by the scalpel. When this operation is to be performed, the patient ought to be placed opposite to the light, and the eyelids secured as already directed. The surgeon then, with a pair of forceps, or a dissecting hook, lays hold of the tumor, and keeps it fast with one hand, while, with a scalpel in the other, he cautiously dissects it away. The fore is to be dressed as after other operations on the eye. I shall only farther observe on this subject, that, when it is found necessary to apply caustic to the eye, the levator formerly mentioned must be used, and is not to be removed until the surgeon thinks his purpose is fully answered. The

eye must then be carefully washed, because, if any of the caustic is left, it will undoubtedly excoriate the eyelids to a great degree. In some cases, where the disease has been of long standing, and obstinately resisted every remedy, putting on at last the appearance of schirrus or cancer, nothing but extirpation can give the patient any chance of relief.

One of the most distressing symptoms with which ulcers of the eye are accompanied is excessive pain. This is sometimes so violent, that a very considerable degree of fever is occasioned by it, and the removal of the inflammation by which it is occasioned becomes a very important object of the surgeon's attention. Besides the usual remedies of general bleeding, purging, &c. recommended under the head of inflammation, very great relief is often procured by dividing the whole of the tumefied vessels of the eye, which appear to meet in the ulcer. It has been supposed, indeed, that, by dividing the lymphatics of the eye, which cannot be avoided in pursuing the method just recommended, there is danger of rendering the cure very tedious, or even forming new ulcers similar to those we proposed to cure; but there does not seem to be any foundation for suspicions of this kind; and I have never met with any instance of the cure of ulcers being retarded, though frequently promoted by scarifications properly made.

SECT.

## SECTION IX.

*OF THE PROTRUSION OR TOTAL DISPLACING OF  
THE GLOBE OF THE EYE FROM ITS SOCKET.*

THIS may be occasioned by tumors naturally formed behind the globe of the eye, or by external violence. When the protrusion is occasioned by a tumor, nothing but the evacuation of its contents, if fluid, or the total removal of it, if of an harder nature, can remove the disease. This ought always to be attempted when the tumors become large, even though by the operation there should be some risk of injuring the sight; for, if the tumor be allowed to go on and increase, it will not only destroy vision totally at last, but very probably, by infecting and corrupting the bones, may bring on mortal disorders. It is worth observing, that, in cases where the bones are affected by tumors in the socket of the eye, they do not always become carious, but assume a soft gelatinous nature; and, when the disease has gone on so far, we cannot expect any benefit from an operation; it must be performed early, or not at all. The only method of removing them is by the scalpel; and it is evident that much care must be taken in performing the operation.

The

The globe of the eye may be forced out of its socket by various external accidents, which it is impossible to enumerate. The Americans, in their quarrels with one another, notwithstanding their boasted civilization and virtue superior to European nations, shew the true vindictive nature of savages, by attempting to put out one another's eyes. This shocking operation they call *googing*, and very dexterously accomplish their hellish purpose, by pushing their thumbs into the internal angle of the eyes, and then turning them outwards. The miserable object of their vengeance is thus rendered totally blind for life; but for this there is no absolute necessity; for, if the optic nerve be not quite destroyed, sight will return upon replacing the eye in its socket, taking care that no extraneous matter gets in along with it. After the eye is replaced, the only thing requisite for completing the cure is to prevent inflammation, which may be done by means of blood-letting, cooling diet, purgatives, &c. already enumerated under the head of inflammations, and in the preceding sections of the chapter.



## SECTION X.

*OF CANCERS IN THE EYE, AND EXTIRPATION OF  
THE EYEBALL.*

SCHIRROUS swellings sometimes take place in the ball of the eye, and surrounding glands, after long and repeated inflammations, and these are as ready to degenerate into cancers here, as in any other part of the body. The signs of a cancer in the eye, are a protrusion of the ball, with an enlargement of it at the same time; the substance itself likewise undergoes a change, acquiring an hard consistence, and the whole fore part of it shooting out into a number of fleshy tumors or fungi, which for the most part discharge a thin and very disagreeable sanies. In the beginning of the disease the patient complains of a sensation of heat, which, gradually increasing, changes at last into the most violent darting and lancinating pains, by no means confined to the globe of the eye, but shooting through the adjacent parts, and sometimes seemingly through the whole brain. I have already treated of cancers, and the attempts that have been made to cure them; and, from what has been said on that head, it must be evident that a surgeon, unless he totally extirpates the eye,  
has

has nothing in his power but to alleviate the pain by such internal and external medicines as have been found serviceable in other cancers. For this purpose, large doses of opiates are to be given inwardly, and an hemlock poultice applied to the eye, which is also to be washed every time the poultice is renewed with lime water, in which opium has been dissolved, in the proportion of a drachm to two pounds. Thus, the patient's life may be rendered a little more comfortable; but, from the knowledge we have of the nature of the disease, no person can rely upon any thing but extirpation for a radical cure. Thus, the disease may be prevented from spreading, and thus the patient's life will be preserved, which otherwise must inevitably be lost; for, if the disease be permitted to go on, the bones become soft, and death ensues, after the greatest misery.

When an eye is to be extirpated, the patient must be laid upon a table, with the head and shoulders considerably raised, so that the diseased parts may be fully exposed to the light. Sometimes, not only the globe of the eye is diseased, but the eyelids also; though it frequently happens that the latter are free from injury. Where this is the case, they ought to be carefully preserved, in order to cover the wound; and, for this purpose, they must be kept out of the way

way with flat hooks held by assistants. In some cases it will be necessary to enlarge the opening, by cutting the external angle of the eye, that so the ball may be removed with greater ease. The surgeon is next to separate very carefully the ball from the eyelids, and to dissect it with an equal degree of caution from the periosteum of the adjacent bones, by dividing the cellular membrane all around. Having then fully freed it in this way to the very bottom of the socket, the muscles and optic nerve are to be divided without scratching the bone; for which purpose, a common scalpel will answer much better than a crooked, or any other kind of knife. But, if the eye happens to be very much enlarged, so that it cannot be easily removed by the fingers, or a dissecting forceps, we may try a dissecting hook; or, should that also fail, we may make use of a ligature passed through the eye with a flat needle.

When the eye has been completely removed, we may easily stop the hæmorrhage with a little agarie, scraped very fine, and applied to the mouth of the bleeding vessels at the bottom of the orbit. The orbit itself is then to be filled up with soft linen, several times folded, and slightly pressed in. Every degree of attention is to be given to keep the patient cool; and, as soon as a plentiful suppuration takes place, the dressings

dressings must be removed. The time requisite for this will be longer or shorter, according to the heat of the season, and degree of inflammation which takes place; and this last will also depend much on the constitution of the patient himself. The fore may be dressed with any kind of slight dressing, such as a little scraped linen put slightly into the orbit to absorb the matter, and this covered over with a strap of linen spread with emollient ointment.

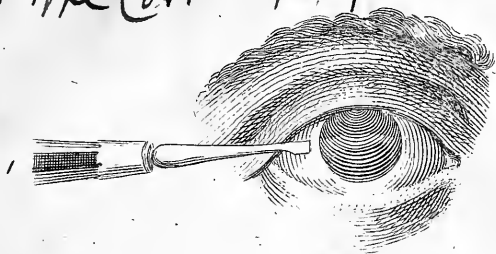
In attempting to stop the hæmorrhage attending an extirpation of the eyeball, if agaric be not at hand, we may successfully use a piece of dry sponge; but here we must observe, that, when sponge is applied, it is apt to adhere so firmly, that there is sometimes a considerable difficulty in removing it. We ought therefore always to fasten a piece of pack thread to the bit of sponge, in order to pull it out when there is no farther danger of hæmorrhage returning.

## SECTION XI.

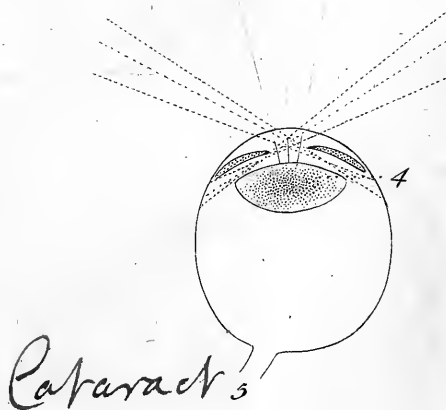
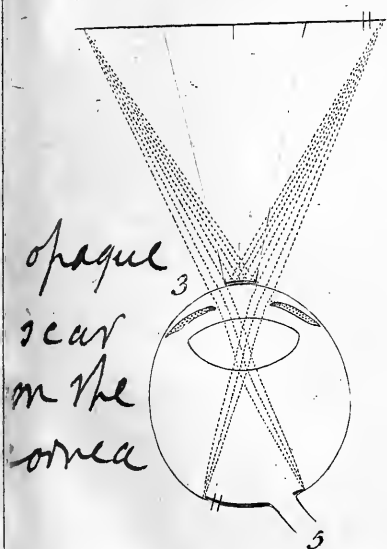
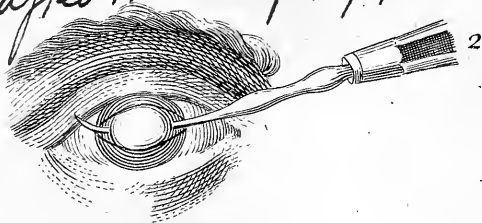
### *OF THE CATARACT.*

**T**HIS disease, formerly supposed to be seated in the cornea, the vitrious humor, or to be a membrane formed in one of the chambers of the eye,  
is

A knife passed thro the sclerotic  
under the cornea, before the iris



A needle passed thro a proptosis  
of the cornea.





is now known to consist in an affection of the crystalline lens itself, or the fine membrane that surrounds it. It commonly begins with a decay of the faculty of vision, which the patient calls a loss of sight, and which usually continues a considerable time before any sign of opacity in the crystalline lens takes place. As the disease increases, the opacity of the lens becomes sensible to the patient, who imagines there are particles of dust or thin clouds floating before his eyes, which he frequently attempts to wipe off, but is surprised to find that his sight never becomes any clearer. Thus, the defect of vision continues gradually to increase, until at last no light can be perceived; and if, during the progress of the disease, the eye be examined, we will evidently perceive an opacity in the lens itself. Instead of being perfectly clear and diaphanous as in health, it appears of a slight milky hue, and this whiteness gradually increases until at last the patient becomes totally blind.

The cataract most frequently proceeds from some internal cause, without any affection of the ball, though sometimes it is occasioned by external injuries. In the former case, the iris always contracts regularly on exposure to light, but not so in case of external injury. The reason is, that where the globe of the eye itself is affected, a certain degree of adhesion takes

place between the iris and lens. Sometimes this adhesion is so complete, that only a small part of the opaque line is observed in the centre, and in this case there can be no assistance from art. It is, however, obvious that no part of the human body can exist without a free circulation, either of coloured or colourless fluid ; and, therefore, in all cases of cataract, we must suppose that the disease proceeds from some derangement in the vessels, though, by reason of their fineness, we cannot demonstrate them as in other parts of the body. The greater the derangement, the more complete will be the loss of vision. At first, indeed, the affection may be but partial ; a small spot only may be affected, and the affection by degrees may communicate itself to the whole, in spite of every attempt to remedy it, till the lens become opaque on every part, though sometimes this opacity is confined to a small part, and the patient still continues to enjoy an imperfect vision. The colour of the lens, as has been observed, is at first slightly white and opaque ; by degrees it becomes more and more milky, until at last it assumes a pearl, or perfectly white colour. The consistence is various, sometimes hard, and sometimes entirely dissolved ; but none of these cases seem at all to affect the colour. When absolutely dissolved, it seems incapable of ever recovering



covering its hardness again ; but in all those which have come under my care, the colour has been equally opaque with those in which the consistence of the lens has been preserved. In twelve cases of a dissolved lens on which I have operated, the dissolution was so complete, that, on entering the needle into the capsule of the lens, the whole was mixed with the aqueous humor ; and all that could be done was to destroy the capsule as completely as possible, that all the milky matter might be evacuated. In ten of these cases, vision was almost completely restored in four weeks from the operation. In the other two, the iris was wounded by a sudden motion of the patient's head, as well as by reason of a convulsive motion of the eye. The wound just penetrated it near the internal canthus ; but, though the instrument was instantly withdrawn, and the capsule of the lens destroyed, so that the milky fluid was all mixed with the aqueous humour, vision could not be restored. A great degree of inflammation took place, the pupil became perfectly contracted, and the patient remained quite blind. In one of those cases, the patient had a cataract of a firm consistence on the right eye. This was carefully depressed, and vision restored ; but, in two days more, the lens had risen up again into its former place, and vision once more intercepted. A considerable

able degree of inflammation took place, and the operation could not be repeated till this went off, which was not till three weeks after. Upon inspecting the eye carefully, I observed a part of the lens at the upper edge moving, as if ready to fall off; and, in two days more, a bit about the size of one-tenth of an inch had disappeared, by falling into the aqueous humour, where it seemed to have dissolved. More of it continued to come away in the same manner, until, in about the space of two months, it was totally dissolved, and the patient recovered his sight. As soon as the first portion of the lens came away, this patient was able to perceive the light at the upper part of the eye; and, as it continued to come away, he had the appearance of fog or clouds floating at times before him, by which he was prevented from perceiving objects distinctly. I have met with four other cases of a similar nature, in all of which the lens, after having risen to its former place, dissolved entirely. In all of them the dissolution began, either at the upper edge of the lens, or that next the external canthus; that next the internal canthus being the last of dissolving; and, in one patient, some remains of it were perceived for near six months.

I am of opinion that we cannot judge of the consistence of cataracts from their appearance,  
but

but think, with Mr Pott, that some difference may be observed in the contraction of the pupil. I have remarked, that, though there was an equal contraction, as in health, yet it was not by any means so complete when the lens was in a dissolved, as when it was in a firm state. This I observed in eight of the twelve cases above mentioned, where the lens was in a dissolved state. Mr Pott seems inclined to believe, that, when the crystalline lens is totally dissolved, it is also somewhat enlarged, while, in what is called the hard cataract, it rather shrinks. What inclines him to be of this opinion, he says, is, that, “when the pupil has been observed always to be in a state of dilatation, even when exposed to a strong light, and, though capable of motion, yet never to contract in the usual manner, he commonly found the cataract to be soft; while, on the other hand, when the pupil has been capable of full and perfect contraction over the cataract, the latter has commonly been found of a firm consistence.” He lays it down also as a subject worthy of inquiry, “whether the soft cataracts have not been found gradually to grow more and more opaque, though very slowly, without any degree of pain, while the firm ones in general become hastily opaque, being accompanied or preceded by severe and deeply seated pain in the head, particularly

cularly in the hinder part of it." I am indeed of opinion, that, by proper attention to these circumstances, some light may be thrown upon the subject; and, from my own observations, I am clear that the crystalline lens, when once it is removed from its capsule, will always dissolve in the aqueous humour, so that vision will be restored, provided the capsule itself be not the cause. In many cases, the capsule itself becomes opaque. In the case of a poor man who had been blowing a stone with gunpowder, an explosion took place in the act of charging, and one of the grains of powder was forced into the right eye, about an equal distance from each canthus, and about an eighth part of an inch from the lucid cornea, appearing to have passed directly into the lens. The other eye was likewise struck by a grain nearly about the same place, but just at the under edge of the iris, this part being completely divided through its whole extent, and this grain also seemed to have penetrated the lens. An inflammation ensued, which soon went off, but was followed by a total blindness; and, in three months from the time of the accident, he put himself under my care. I found a cataract in each eye, almost of a milk white colour; the iris in the left eye was in a sound state, and capable of its usual motion, but by reason of the wound in the right  
it

it had been elongated, so as to be reduced to the breadth of about a line and an half, with only a slight motion when exposed to a strong light. The lens of the right eye being of a firm consistence was depressed, and it did not arise again. In fourteen days from the operation his sight was restored so completely that he could read large print. He then went to the country, but, in eighteen months returned, informing me, that, though at times he could see distinctly, yet at others, when his eye was moved in a particular manner, he saw something like a large scurf interrupting the greatest part of his field of vision. This commonly did not continue long; but he had no warning, either of its coming or its going off, only he thought it came from the corner of his eye next the nose. On examination, I observed a whitish membranous substance next the internal canthus, apparently in a continual undulating motion, which I took to be a portion of the capsule of the lens that had become thus opaque. As the patient was very desirous of having this removed, I immediately set about performing the operation. The event showed that I was not mistaken in my conjecture. Having succeeded in depressing it with the round needle towards the maxillary plate, and the bottom of the vitreous humor, I observed, that, as soon as I attempted the depression, the upper  
part

part fell down as it were on the needle, and instantly disappeared. Very little inflammation took place after the operation; and in a few days his sight was so completely restored that he could write, and distinctly read large print, without the use of glasses.

In the cure of cataracts we can have but little dependance upon medicines taken internally. In some few instances, indeed, where the disease was but just beginning, mercury has been found useful. Extract of henbane, flamula jovis, and some other vegetable extracts, have been commended in cases of incipient cataracts; but, in all probability, without any good reason. The only medicine upon which we can depend, if indeed we can depend upon any, is calomel frequently given in small doses. Sometimes, when the cataract is attended with any degree of inflammation, venesection, with other antiphlogistic remedies, may be found useful; but, when the disease increases, as it commonly does, we must have recourse to an operation. This, for a long time, consisted in depressing the lens below the pupils, so that its opacity could no longer intercept the light, and the eye was found to suffer no detriment from the lens remaining in that unnatural position, more than what might have been expected from the loss of such a principal part of the organ. This operation is called

called *couching*, and continued to be universally practised, till that of extracting the lens by opening the cornea, and squeezing it through the pupil. In my opinion, however, the method of couching is by far preferable. The only objections that can be made to it with any appearance of reason are,

1. That when the cataract is soft, the end of the operation will not be answered, as the opaque fluid must be diffused throughout the whole contents of the eye. It is also said, that, when the cataract is of the mixed kind, *i. e.* partly hard, and partly soft, the operation will in like manner probably fail of success, because it is impossible to depress the soft parts; and the found ones will either elude the point of the needle, and form a new cataract in the posterior chamber of the eye, or getting through into the anterior one, require a new operation to extract them. But this, from my own experience, I can disprove; and, from the testimony of the best practitioners, it appears that cataracts, both of the very soft, and of the mixed kind, may be cured by couching, as well as the hardest. Indeed there is no such thing as a very hard cataract. I have already mentioned my opinion, that the crystalline lens will always dissolve when divested of its capsule; and I have the satisfaction to find that the best prac-

tioners agree with me. Mr Pott is clearly of opinion that no cataract is ever found of that firm, hard, and indissoluble nature, which many authors mention; nay, he is even at a loss whence the idea has arisen, unless it be from the hardness of the eyes in boiled fishes. “Certain I am, (says he), that this idea is not borrowed from nature. Let any man examine the most firm opaque crystalline, taken from the eye of a living person; and which, from its firmness, passed out through the pupil and the divided cornea with the greatest facility, he will generally find it to be, in figure, size, and consistency, exceedingly unlike, either to the found and natural crystalline, or to one rendered opaque by heat; and he will find, that such alteration of shape and size is owing to a partial dissolution of its surface, particularly of its anterior one; in short, if he will examine it carefully, and without prejudice, he will see that what he calls an entire firm cataract, is most frequently little more than the nucleus of an opaque crystalline.”

2. It is objected to the operation of couching, that, if the cataract be of that firm solid kind which some authors are pleased to imagine, the opacity and indissoluble nature of it will prove some obstacle to distinct vision. This has already received a sufficient answer from the observations



servations just now made ; and besides, we may likewise remark that the objectors involve themselves in direct contradiction ; for, if the cataract, however indissoluble, be depressed, and removed from behind the pupil, what detriment can it then be to vision ? But no such cataract as they contend for has any existence.

3. Some writers have urged, that, as the cataract is at any rate to be destroyed, it is better to remove it at once by extraction, than merely to displace it, since the operation is attended with such danger of its return, by rising up again. But here again we are involved in contradiction ; for, if the cataract is destroyed, it can only be by dissolution ; and, if this is the case, how can it be indissoluble ?

4. It is objected, that, by depressing the cataract, we must essentially injure the organization of the eye, and particularly derange the texture of the vitreous humour. But, to this it may be replied, that experience is against the objection. Patients who have been couched recover their sight as perfectly as we can suppose them to do, after losing such an essential part of the eye ; and, upon a fair comparison, it may with great probability be affirmed, that the advantage is on the side of couching. Besides, though we cannot deny that much mischief may be occasioned by an unskilful operator who undertakes to couch

a cataract, yet the extraction of it is not a jot more easy; nay, from the very manner of operating, *viz.* pressing the lens out through the pupil, the extraction must be much more dangerous than couching. There is not any operation in surgery which may not be productive of much mischief, if unskilfully performed; and the same objection might be made against every one of them. No doubt, where there are two ways of doing any thing equally well, we ought to take that which is most easy; but, from what I know of the two operations in question, I must decidedly give my opinion in favour of couching. However, of this the reader must judge from the description to be given of both.

5. The only objection against couching, that has any appearance of weight, is that property of the capsule to become opaque, and of which I have already given an instance. In this instance, the opacity came on by external violence; and, in this way, it is said, that cataracts have been formed almost instantaneously; and these in all probability have been the consequences of a diseased state of the capsule. In many cases, however, this opacity of the capsule will disappear in a longer or shorter time, according to the degree of the disease; or, if it should not, it can never fail of being removed by a new operation, as was the case with my patient. It  
has

has frequently been taken for a portion of the depressed crySTALLINE risen up again; but from this it may easily be distinguished, by the membranous appearance which it has in its diseased state.

Before we proceed to any description of the mode of couching, it will be necessary to take notice of a very general opinion which has taken place concerning the nature of cataracts, *viz.* that, for a certain time it is improper to attempt the operation, and that we must wait till they have attained a particular consistence, or become *ripe*, as they call it; and this ripeness, the operators tell us, they can distinguish by the eye. This idea has probably taken its rise from observing that some cataracts were quite soft and fluid like milk, while others were of a more solid consistence; and it was imagined that this firmness was acquired by age. Enough, however, has been said to invalidate every theory of this kind; and, though there had not, the disagreement among those who contend for it, evidently shows that they have no distinct idea on the subject. Some have laid it down as the sign of a ripe cataract when it is of a milk white, others of a pearl colour; but these appearances, as has already been remarked, are entirely fallacious, and no dependance can be had upon them; and we may lay it down as a rule that  
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the operation of couching may be performed at any time, when other circumstances render it eligible.

As this operation is generally followed by an inflammation of the eye, it becomes a matter of importance to guard against this consequence as much as possible; the patient ought to be kept on a cooling diet, with the use of laxatives at proper intervals; and when the operation is to be performed, though we ought to make choice of a room sufficiently light, yet the admission of the sun beams is improper; and therefore, where it can be procured, a room with the window facing the north is to be preferred. In performing the operation, the eye must be fixed by means of the elevator; the patient ought to be seated on a chair of sufficient height, and the surgeon stands before him, resting his elbow, as it were, on the top of his right os ilium, with the ring and little fingers resting on the ossa malarum, or cheek-bones of the patient. Thus, he will find his hand much more steady than when his foot is placed upon a stool, and his elbow upon his knee, as is commonly recommended. The patient's head is to be secured by an assistant, upon whose breast it rests. This assistant keeps the head steady, by placing his left-hand upon the forehead of the patient, elevating the upper eyelid with the elevator in his hand, and  
securing

securing the eye by means of it, while the patient's hands are secured by two assistants, one on each side. The surgeon then, standing before the patient, takes the needle represented Pl. 5. Fig. 1. in his right hand, holding it in the same manner as a pen to write with, placing then the elbow on the hollow of his side, either right or left, according to the eye on which he operates, and resting it, as already directed, on the top of the ileum, he places the ring and little finger on the cheek-bone; he then secures the under eyelid with the fore and middle fingers of the left-hand, and making the patient look a little in towards the nose, he fixes the eye in that position, then presses it gently upward with his two fingers against the elevator, in the hands of the assistant. He then brings the point of the instrument nearly in contact with the sclerotica at its middle, and about a line and an half from its junction with the cornea. It must then be quickly and steadily pushed through the coat of the eye, with the flat side of the needle towards the iris. Great care must be taken at first, that, in pushing the needle through the coat, we do not wound the iris; and the same care is requisite in pushing it behind the iris to the centre of the lens. The point of the needle will be easily discernible through the pupil; and, as soon as it is observed in this situation, the point must be turned,

turned, as it were, into the body of the lens, when it is to be pushed gently downwards, depressing its point, by gently elevating the handle of the instrument. In this operation, the surgeon's aim ought to be to push the upper edge of the lens downwards and backwards, to the back part of the eye, towards the place where the optic nerve enters the ball. The under edge of it will then be in the bottom of the posterior chamber, and at the sclerotic coat, just where the edge of the iris is connected with it. Thus, it will be fairly lodged below the vitreous humour, or in that part of the ball immediately above the orbitary plate of the maxillary bone, completely out of the axis of the eye, and in no danger of rising up again; particularly, if the ball of the eye be gently compressed, so that part of the vitreous humour may occupy the place of the latter, while the lens occupies that which the vitreous humour had abandoned.

The operation being finished, we must remove the pressure from the eye, and take away the instrument. The eye should be covered up with a soft compress, as already mentioned, dipped in solution of sugar of lead, kept on with a bandage made of a triangular napkin, which may go round the whole head, being supported by the upper part of the forehead. To prevent inflammation, the patient must be kept on a low diet,

diet, and be shut up in a dark room; he must be purged briskly every day, or every second day, the compress being kept constantly moist; or, if any appearance of inflammation should come on, or any pain be felt, we must take some blood from the jugular vein; or, should the symptoms be violent, twelve ounces must be taken from the temples, by cupping and scarifying; and, until all signs of inflammation are removed, we must never once think of opening the eye. The bad effects of taking off the dressings too soon I have sometimes been a witness to, having seen the bad symptoms return with violence after they had been fully removed, and that with so much violence, that the eye was in danger of being totally lost, and the sight forever destroyed. In general, the pain will be removed in eight or ten days; and it will be much better to wait this time than to run any risk of injuring the patient, by taking away the dressings sooner. Sometimes the patient can not only perceive the light, but distinguish different objects, as soon as the dressings are removed; but more frequently it happens that he continues as blind as before, and that it is a considerable time before he recovers his sight. It is not indeed easy to say what the length of time may be before the patient recovers his sight. This depends very much on the nature of the cataract;

when it is of the soft kind, the whole flows out, and mixes with the aqueous humour, as soon as the capsule of the lens is broken by the needle. This circumstance, however, is by no means unfavourable for the patient; on the contrary, he will in this case generally recover his sight as quickly as if the lens had been most completely depressed, the aqueous humour usually becoming clear in a very short time. When the cataract is partly soft and partly hard, some time longer will generally be required; for the dissolution of the hard parts requires more time than it usually takes to clear the aqueous humour. Sometimes, indeed, the former parts of the lens will still remain in the capsule, and form a new cataract, which indeed is the worst that can happen; but, even when this is the case, or where the lens has risen again to its former place, we are not to attempt any new operation for at least three months; all this time being necessary to remove any inflammation that may have come on, or to prevent any new inflammation from taking place. After this space of time, the operation may be repeated with safety, and managed in the manner already directed.

In general, it seems that the dissolution of the cataract, or the parts of the diseased lens, depends very much on the capsule being thoroughly wounded by the needle, so that the aqueous  
humour



humour can have free access to it ; for this seems to be the true solvent of the crystalline, and to be only kept from acting upon it in its natural state by the capsule or fine membrane which surrounds it. It is possible, however, that in some patients the texture of the lens itself may be naturally more firm and hard than in others, which may account in some measure for the great difference there is in the time required for dissolution. Mr Pott says that he has seen the eye become quite clear within a week after the operation, and he has also seen two months required for the dissolution of all the opaque parts. The experiments he has made on the subject, indeed, seem to establish this fact of the dissolution beyond all doubt. I have sometimes, says he, when I found the cataract to be of the mixed kind, not attempted depression, but have contented myself with a free laceration of the capsule; and having turned the needle round and round, between my finger and thumb, within the body of the crystalline, have left all the parts in their natural situation ; in which cases I have hardly ever known them fail of dissolving so entirely as not to leave the smallest vestige of a cataract. In a few instances, where I have had fair opportunity, I have pushed the firm part through the pupil into the anterior chamber, where it has always gradually and perfectly dissolved and disappeared,

appeared, not producing pain or trouble, while such dissolution was accomplishing. He gives also an instance of an old man, whom he couched, in whom the cataract was as firm as any he had ever had an opportunity of observing. The man died of the small pox in fourteen days after the operation, so that Mr Pott had an opportunity of examining the affected eye. "The cataract lay just below and behind the uvea, toward the external canthus. It was become small, irregular, and was manifestly in a state of dissolution." Certain it is, however, that, be the cause what it will, some patients are very long before they regain their sight perfectly, after having been couched of a cataract; and there are instances of the recovery not being quite completed in three months after the operation.

From what has been said of the mode of operating upon a cataract, we may see that the design of the operation is to remove the diseased lens from the axis of vision as completely as possible, not to force it into the vitreous humour; for, though this be done, there is still danger of it not being out of the way of the rays of light; and thus vision will be still as much obstructed as before, or it may very soon rise up again, and renew the disease. But, by depressing it below the vitreous humour, the lens is most completely put out of the way, and there is but little danger

ger of its rising up again. The different speculums for fixing the globe of the eye, when the operation for the cataract is to be performed, are represented Pl. 5. Fig. 4. 5. and the different needles are shown Pl. 5. Fig. 123. where there are likewise shown the forms of needles for such as cannot use the left hand as well as the right. Many operators have recommended the use of speculum for securing the globe of the eye while this operation is to be performed, though the generality (and I must confess myself one of the number) are of opinion that it is improper. The advantage said to be derived from it is, that, by means of it, the eyeball is more perfectly secured than it can be by means of the fingers alone. But this advantage, if it really does exist, is more than counterbalanced by the great degree of irritation it occasions, and which even the late boasted improvements have not been able to prevent. Besides, there is not the least difficulty in fixing the eye at two points only; *viz.* immediately at its centre, with the two fingers of the left hand, and by means of the levator palpebrarum, as already mentioned. The pressure is also more easily regulated with the fingers than when the speculum is used; nor can the danger be so great though the pressure should happen to be rather strong with the fingers, as when an hard instrument is made use of; for, with the  
speculum,

speculum, there is a chance of suddenly pressing so much upon the ball as to force the contents of the eye forward upon the iris, and injure it; an accident which, I think, I have seen more than once from this very cause. When the fingers only are used, however, the very reverse happens; for the surgeon will be more apt to pull them down, than otherwise; and, when he does so, the pressure is entirely removed, by which no danger can ensue to the patient.

The needles made use of for couching are of two kinds, round and flat; but I think the flat ones preferable, for the following reasons. 1. The round needle, after having entered the cataract, leaves it with too much ease. 2. It requires more force to penetrate the coats of the eye with a round than a flat needle. 3. After it is in, it cannot be moved with such ease as the flat one; because the latter, in penetrating the coats of the eye, makes a broad wound with its flat part, so that the round part of it has freedom to move in every direction. The only objection to the use of the flat needle is, that it has been supposed ready to wound the iris more than the other; but this cannot well happen, if we take care, which always ought to be done, to introduce it with the flat side towards the iris. The method recommended by some, of entering the needle into the transparent cornea, is frequently

quently attended with this accident, and ought therefore never to be practised.

## SECTION XII.

*OF EXTRACTING THE CATARACT.*

THIS operation consists in opening the transparent cornea, and making therein a wound of sufficient size to allow the lens to pass through it, after passing through the pupil into the anterior chamber of the eye. The first hint of it seems to have been given by Mr Petit, who proposed to make such an opening for extracting the lens, after it had been forced through the pupil, either accidentally, or in making an attempt to couch, which has frequently been the case. At first it was looked upon as an extremely dangerous operation, and very seldom practised; but, about the year 1737, it began to come in vogue, on the authority of Mr Daviel, already mentioned, and since that time has been pretty generally preferred to the other, though in my opinion without sufficient reasons. When speaking of the cataract in general, I have stated some reasons why the operation of couching seems preferable to that of extraction. There are, however, many strong,  
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and indeed unanswerable objections, to the performance of this operation in any case.

1. It cannot be done without wounding the transparent part of the cornea, and thus endangering the loss of sight, by the opacity of the cicatrix, which takes place afterwards.

2. By pressing on the globe of the eye, great part of the vitreous humour is sometimes forced out; the consequence of which is, that the eyes immediately sink, and the sight is totally destroyed. The blindness which ensues from this cause is not indeed always permanent; and there have been many instances where the vitreous, or some other humour, has been collected in such quantity, as to swell up the eyes again to their natural bigness, and the sight has been restored in some degree.

There has not, it seems, occurred any opportunity of examining the eyes of such persons after death; a dispute therefore has arisen, whether the humour which has been thus regenerated be a new collection of vitreous humour, or whether both chambers, as well as the ball of the eye, have become full of the aqueous humour. This debate might be determined *a priori*, provided we knew what degree of sight had been regained by those in whom an evacuation of the vitreous humour had taken place. As the eye contains three kinds of humours, each of them differing in density

from another, we may very reasonably conclude that there is a certain purpose essential to perfect vision, which every one of them answers, and without which people could not see distinctly. Nobody will pretend to say, that, if *all* the humours were taken out of the eye, there could be any sense of vision whatever. If one of them is removed, the sight is considerably impaired, as we observe in those who are couched of cataracts. If two of them are taken away, the sight ought to be much worse; and indeed we can scarce see how *one* humour could answer the purpose of refracting the light into any kind of distinct focus, as the eye would then resemble a globe filled with water; so that though one object might perhaps be seen distinctly, when in a certain position, all the rest must be monstrously distorted. It is probable, therefore, that the vitreous humour of the eye may be regenerated after once it is lost, as well as any other humour of the body. It would be very odd, indeed, if this humour should be the only exception in the whole body, and no reason can be shown why nature should not have made a provision for the renovation of it, as well as the aqueous. It is true, indeed, that there is no instance of any reproduction of the crystalline lens when once it is taken out; but this we must consider as a solid body contained in a capsule, that this cap-

fule is connected with other parts, by means of vessels from which it receives its support. When the capsule is destroyed, with the vessels which support it, it is not wonderful that it should not be reproduced, any more than that a leg or an arm should not be reproduced after it is cut off, or a testicle after it is cut out. The vitreous humour, on the other hand, is in all probability supplied from the internal coats of the eye; and, while they continue sound, we must always suppose them capable of performing their office, and consequently of reproducing the vitreous humour when it has been evacuated.

3. By the violence sometimes used in forcing the cataract through the iris, it is frequently protruded outwards, and the pupil becomes distorted and irregularly shaped. Sometimes the iris is protruded as far as to get into the wound in the cornea; and, when this happens to be the case, we know that the accident has happened, by the patient feeling acute pain, particularly when the eye is moved, the protruded membrane being rubbed every time against the eyelids; and, when this is the case, it very often happens that it adheres to the wound of the cornea. To this, as well as to the former objection, it may indeed be replied, that neither of the accidents can happen, unless through the unskilfulness of the operator. This, however, seems



seems not always to be the case. When the aqueous humour is let out, the pressure from before is taken off from the vitreous humour, which therefore naturally tends to force itself out. A very little degree of pressure then may occasion its evacuation; and, though we may say that this is the fault of the surgeon, yet it frequently happens that the whole contents of the eye are forced out by spasm. In the mode of operating by extraction, therefore, there is a danger to which the operation of couching is not liable, and of consequence the latter is preferable.

4. It is always of consequence to a surgeon to give the patient as little pain, and himself as little trouble as possible; for the less pain to which the patient is put, the sooner will he recover; and the less trouble to which the surgeon puts himself, the less danger there is of his committing any mistake. I am therefore decidedly of opinion, that couching a cataract is much preferable to the extraction of the lens.

The instruments necessary for performing the operation of extraction are different from those requisite for couching, as one called an *hasta* is now requisite, such as is represented Pl. 4. Fig. 4. for fixing the eye. A knife, represented Pl. 4. Fig. 8.; and, as one of the grand objects in this operation is to prevent the aqueous humour from  
escaping

escaping during the operation, till the incision in the cornea is fully finished, the blade of this knife must gradually increase in breadth from the point, and thus the wound will be enlarged as it passes along. At the same time, the incision will be filled up by the knife as it is made, so that the aqueous humour has no means of escaping. As the success of the operation depends entirely on the opening of the cornea, the knife ought, at its broadest part, fully to equal half the breadth of the cornea, that is, about three lines in breadth, or nearly so, and this, at least, ten lines distant from the point.

It must now be evident, that, in traversing the cornea, from the external to the internal canthus of the eye, the inferior part of the cornea will be divided, as soon as the broadest part of the blade enters the eye, without any necessity of drawing it backwards and forwards, the whole incision being performed at once, and the aqueous humour cannot flow out until all is finished. The knife is to be convex on both sides; from which form it is plain, that, while such an instrument crosses the eye, the iris will be pushed back, and kept out of the way of the edge. The point is to be sharp on both sides for the breadth of a line; and it ought likewise to be tempered in such a manner that it may neither bend nor break. Its back must be quite straight,  
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and quite blunt, though not very thick ; care being taken that the back may continue blunt, though the knife be sharpened. This is the knife recommended by Jn. Bischoff, oculist to his Majesty.

The needle for extracting the cataract is represented Plate 5. Fig. 1. A little broad hook for keeping down the under eyelid, when the eye is to be fixed by the hasta, is shown Plate 4. Fig. 9. It acts, by having a key, or other small weight, hanged upon it. Plate 4. Fig. 6. shows the elevator for the upper eyelid properly bent.

When the operation is to be performed, we must carefully exclude from the room every light which any way crosses or interferes with the rest ; the windows must all be shut, excepting that one which gives the best light. The assistant must be enjoined not to look what the operator is doing ; for, as he is placed behind the patient in the same manner as in couching the cataract, he is apt, by hanging forward over the head of the patient, to be in danger of pressing upon the ball of the eye, and force it forward upon the knife ; or, even sometimes, if the wound is completed, to force out the lens and vitreous humour both at once. Strict injunctions therefore must be laid upon him beforehand to attend only to the directions of the operator.

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The patient, in this, as in the former operation, is to be seated in a chair opposite to a clear north light, with his hands secured, either by assistants or otherwise, so that he cannot raise them, so as to disturb the surgeon in the performance of the operation. The latter may either stand or sit, but in such a position, that his mouth may be nearly in a right line with the patient's eye. The light should fall upon the patient in such a manner, as to cross, as it were, over his nose, to the affected eye, by which means the surgeon will not incommode himself, either with his own hand, or the handle or blade of the knife. The patient's other eye must be covered with a piece of folded linen, tied on with a napkin, and his head is to be supported by the assistant as directed for couching; and the eye is to be elevated in the same manner, by the instrument there recommended; but this ought never to be applied by the assistant. His business is to keep his right hand under the chin of the patient, so that his head may be turned a little upwards; and he must keep the elevator with his left hand, pressing it gently upwards against the edge of the orbit. The surgeon must secure the under eyelid in the same manner as directed in couching; only, in this case, the pressure must be made a little stronger with the middle finger, to hinder the eye from retreating in-

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to the inner angle. He must next take the knife in his hand in the manner he holds a pen; and, placing his arm and forefingers in the same posture as directed for couching, he watches attentively the motion of the eye, till it looks directly forward, and a little upwards. As soon as he perceives it in this situation, he enters the point of the knife into the cornea, about half a line from its junction with the albuginea, and as nearly in the centre of it as possible. He must never attempt to introduce the knife until the eye is in this position, and the incision in the cornea must be completely semicircular, beginning in the outer corner of the eye. The knife is passed across the pupil, to the inner angle, the point being pushed out at the same distance as that at which it was first entered.

The whole under half of the cornea is now divided from the albuginea, the division being made by putting the knife across the anterior chamber of the eye, till it passes out at the inner corner. In making it, the knife must be kept quite parallel to the iris, but the edge of it turned a little outwards, and the incision finished, by pushing it forward, till its largest part divide the under part of the cornea, as already mentioned. The upper eyelid, being still supported by the assistant, must be allowed to shut, while his head is to be turned considerably backward,  
until

until the eye be in a horizontal posture. If the operator was sitting, he must now rise, and endeavour to open the capsule. The opening ought to be as large as possible; if the whole interior part of it can be brought away with the lens, so much the better; and if any of the lens is divided, it must also be brought away. The operator is now to take with his right hand, the spoon represented Plate 5. Fig. 6. with which he elevates the separated cornea, so as to allow him freely to pass through that, as well as the pupil, the above mentioned needle, sharp on both sides. Taking this needle in his left hand, he keeps down the under eyelid with the little finger of the same hand, passes the needle through the cornea into the pupil, and tries to scratch away the whole forepart of the capsule.

Having now fully opened the capsule, by placing the fore and middle fingers in the position they were in while the cornea was cutting, and pressing gently on the under side of the ball, he will observe the lens to turn round, as upon its axis, the under edge turning upwards and outwards through the wound; and, by continuing a slight degree of pressure, it falls down upon the cheek.

Thus, the operation of extracting the lens is at last completed. During the whole time of performing it, the utmost caution is necessary.

The eye must be kept steady, and look straight forward, without being either turned up or down; and, as soon as the process is finished, we must shut the eye gently, unloosing the napkin from the sound eye, and putting upon both a pledget wetted with a weak solution of sugar of lead. These pledgets are to be kept on by a napkin tied in the slightest manner; the patient is to be put to bed, with his head and shoulders considerably raised, the room must be darkened, and the compresses constantly kept moist. Should any signs of inflammation appear, we must have recourse to blood-letting at the arm, which is here of the greatest use. A cooling laxative should be given every third day; and, throughout the whole cure, the patient must be strictly kept upon an antephlogistic diet.

Sometimes the patient complains of a sense of fulness, with pain in the eye, which continues to increase for some hours. This is occasioned by the gluing of the eyelids together by the aqueous humour, possibly mixed with some of the lens, or even the vitreous humour. Thus also sometimes the puncta lachrymalia are completely shut up. This, however, is easily remedied, as the surgeon has only to rub the inner corner of the eye gently, till the tears flow freely. The wound in the cornea very soon unites, and the patient will frequently be free from pain in a ve-

ry short time. But, even though these favourable circumstances should occur, we are not to look into the eye sooner than ten days ; and even then, no more light is to be admitted than what is absolutely necessary to show the objects in the room, when his back is turned towards the window.

When the eyelids adhere together, it is obviously necessary to soften them well with warm water, previous to any attempt to open them, lest we should put the patient to a great deal of needless pain, besides the risk of doing him more essential injury, should a slight degree of distension still remain in the vessels of the tunica conjunctiva, it will be useful to wash them with a mixture of one tea spoonful of brandy, with five of water, or a solution of five grains of white vitriol in two ounces of water. By continuing the use of these medicines, the eye will gradually acquire strength, and vision frequently be restored beyond our most sanguine expectations, when the operation has been skillfully performed. It must be owned, however, to be a difficult operation, and unluckily, if the disease happens to be in the capsule, the extraction of the lens cannot answer any purpose. When this happens to be the case, some practitioners have advised the removal of it by forceps, or some other instruments adapted to the  
purpose,



purpose. Others advise the use of antiphlogistic remedies; and instances have indeed been known where nature has performed a cure in this way, while there are no examples of the disease having been removed in the other way.

The most dangerous consequence of this operation, is the inflammation which takes place after the wound in the cornea; and on this account we ought to be particularly attentive to guard against all irritation, by exposure to light or otherwise. Even in the time of performing the operation, however, a very disagreeable circumstance frequently occurs, viz. such a degree of spasm, as sometimes to force out all the contents of the eye at once. From this we learn, that in performing the operation of extracting the lens, we ought not to use a speculum, but rather to trust to the pressure of the fingers entirely; for the irritation of the instrument is so great, as frequently to bring on the spasm attended with the mischievous consequence already mentioned. If, however, without this spasm, the vitreous humour appears either at the coming out of the lens, or soon after it, it must be from a fault of the assistant or surgeon, by pressing too much on the globe. When this unfortunately happens, the eye must instantly be shut, and the face kept upwards till the commotion ceases, and the surgeon can finish the operation with

with safety, and without any trouble. When the iris happens to be protruded, we must carefully replace it in its natural situation, before it becomes swollen, or adheres to the wound. To do this, we must raise the cut cornea with the back of the spoon, gently returning the iris to its proper place, and by an easy pressure, and rubbing the eyeball, it will be retained where it ought to be.

Sometimes the cicatrix which takes place after the incision made in the lucid cornea, is so opaque, that the sight is as much darkened as if the cataract remained. This, however, is owing to the operation having been improperly performed; for, if it were done according to the directions we have given, the incision would never be less than two lines from the edge of the iris, even in the most dilated state of the pupil. In all the cases indeed, where I have seen the operation of extraction performed in this country, except four, which were done by two very eminent practitioners, and who followed the method above laid down, it was always done in such a manner that the iris could not but adhere to the wound. The reason of this bad success was, that too small a wound had been made in the cornea, only a little triangular bit being cut out of the cornea, which did not allow the lens to be brought away, but with so much pressure,

sure, that the vitreous humour came away at the same time. When a part of the vitreous humour comes away, the under edge of the iris is generally forced into the wound, and no care being taken to remove it, an incurable adhesion takes place. Thus, the unhappy patient receives no benefit for all he has suffered, but, on the contrary, is rendered totally blind, unless, which very rarely happens, the opacity occasioned by the cicatrix runs along the under edge of the iris, and the centre of the cornea remains transparent. When these fortunate circumstances occur, the patient may see objects that are on a level with his eye, or above it, but never below it, unless he turns his head downwards.

On the whole, I must once more give my opinion, without reserve, in favour of couching, preferable to the extraction of the lens. The only solid objection to couching is, that when the disease happens to be in the capsule, we cannot remove it by depression. But this objection is equally valid against extraction; nay more so; for I have already given an instance where the capsule was depressed, or some way removed from the axis of vision, after it had become so far diseased as to obstruct the sight. But, though we thus see that the objection was not held altogether good against couching, there is the strongest reason to believe that it always will do  
so

so against extraction. We may indeed tear out the capsule by violence, but this cannot be done without injuring the eye in such a manner as to destroy sight entirely. Against the extraction of the lens, however, the following unanswerable objection may be proposed, namely, that though the patient may be relieved, and enjoy his sight for a time, yet the relief is by no means permanent. There have been innumerable instances, where, after the patient has continued to enjoy his sight for a few months, yet a gradual contraction of the pupil has then begun to take place, attended with a decay of sight, which at last has ended in total blindness. This is undoubtedly owing to a spasmodic affection induced on the fibres of the iris by the injury it has received during the operation; and that it should not take place immediately after, is no more wonderful, than that a patient, after having a punctured nerve, should, for some time after such an accident, feel little uneasiness, and yet at a certain period the most violent symptoms should ensue. The method of extracting the lens seems to have come in vogue principally on account of the sudden relief that is obtained; for the return of sight comes almost instantaneously; but this seeming advantage is much more than compensated by the additional pain and inflammation,

flammation, and, above all, by the subsequent decay, and very common loss of sight.

Some modern authors have mentioned cases in which the lens has been too big to pass through the pupil; but accounts of this kind are not to be depended upon. It is not the magnitude of the lens, but the smallness of the cut of the cornea, that is the fault. The proper method of performing the operations, both of couching and extracting the lens are represented Pl. 5. Fig. 6. 7. 8.

### SECTION XIII.

#### OF THE FISTULA LACHRYMALIS.

THIS disease is so exceedingly various in its appearance, according to the constitution of the patient, and the time of its continuance, that it can scarcely be known at different times, and in different patients, by those who are not very well acquainted with it. Hence, some eminent authors, particularly Mr Pott, have been of opinion, that we ought to enumerate a number of different diseases incident to this part of the body, all of which are now confounded under one general name of fistula lachrymalis. This, however, I think would rather create confusion than perspicuity;

perspicuity ; and, as long as these diseases agree in one general leading symptom, which here is the stoppage of the nasal duct, they undoubtedly ought to be accounted the same. Before we proceed to treat particularly of the fistula lachrymalis, however, it will be proper, notwithstanding what was formerly taken notice of, concerning the anatomy of the parts, to speak a little farther of the structure of these parts.

The surface of the eyeball is kept continually moist by means of a fine pellucid and limpid liquor occasionally produced in abundance, and named *tears*. This liquor is secreted by a large gland, named the lachrymal gland, seated near the external canthus of the eye, in the upper part of the orbit. A small papilla is situated at the extremity of the borders of the eyelids, on the side next the nose, inclosing a small red gland in the internal angle of the eye, named *caruncula lachrymalis*, from a notion formerly entertained, that this, and not the gland, was the secretory organ of the tears. Each of these papillæ has a small hole in it. These are named the *puncta lachrymalia*. The office of these is now known to be to receive the tears when secreted in the natural way, and convey them into the nose ; they being indeed no other than the extremities of a channel which reaches to the inside of the nose, and thus carries off  
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the superfluous lymph. Before it reaches the nose, however, this duct widens into a small sac called the *sacculus lachrymalis*, or lachrymal sac, from whence becoming again very narrow, it proceeds towards the nose, penetrating its internal membrane, and conveying the lymph into the cavity behind the *os spongiosum superius*. In health, the lymph meets with no obstruction in its passage through this duct; but, when any obstruction takes place, either from a disease of the fluid itself or the duct, the tears flow down the cheek, the lachrymal sac is distended so as to form a visible tumor, and the disease we call *fistula lachrymalis* takes place.

From this description of the parts affected by the disease in question, we see that great varieties must occur in it, as one or other of the parts concerned is more or less affected; though, considering the general nature of it, all of them must be essentially the same. The most simple kind of it, is that termed by the French surgeon's, *hernia*, or *hydrops sacculi lachrymalis*. Children of an unhealthy and rickety constitution are subject to it. It shows itself by a tumor of the lachrymal sac, the tears being retained in it till they become thick, and being mixed with the native mucus of the part, put on the appearance of matter. With this kind of substance the eyelids are glued together in the morning,

and some quantity of it may be squeezed out at the corner of the eye through the puncta, and sometimes a slight inflammation of the eye is joined with the rest of the symptoms. During the day time the liquid runs down the cheek, and this, with the gluing together of the eyelids while the patient sleeps, are the inconveniencies attending this disease. As the fistula proceeds immediately from an obstruction in the nasal duct, it may be occasioned by an inflammation of the membranes of the duct, by which the passage of the tear will be choaked up. In the first stage of the disorder, the patient observes a small tumor in the internal canthus of the eye, which usually disappears on a slight pressure. By this pressure, the tears are forced into the nose, through the straitened duct; and, if the pressure be carefully applied now and then, as occasion requires, a total obstruction may very frequently be prevented. When this happens to be neglected, the swelling increases considerably, it becomes at last painful, inflames, and forms a point at the under part, where, if it is not opened with the point of a lancet, it commonly bursts of itself, discharging along with the tears some quantity of purulent matter. Mr Pott, however, seems to be of opinion that true pus is very seldom discharged in this disease. According to him, the inflammation brings on an increase of tumor  
and



and of the matter discharged, the skin directly above the tumor becoming hard and inflamed, and with the mucus a mixture of something, which, in colour, resembles matter, is discharged, especially if the pressure be made with any force, or continued for any time. This circumstance, added to the painful sensation and inflamed appearance of the parts, has been productive of a supposition, that in this state there is either an ulcer or an abscess within the sacculus or duct.

Mr Pott adduces a great deal of argument, to show that there is a difference between pus and mucus, a point now well determined, and concerning which, it is foreign to my present purpose to enter into any discussion; but, notwithstanding the very positive assertion of Mr Pott, that "abscess or ulcer very seldom, if ever, attend" the fistula lachrymalis, I must still be of opinion that true pus is sometimes discharged along with the lymph; and indeed, in scrophulous habits, or where the constitution is tainted with the venereal poison, in both which cases we may say there is a general tendency to ulceration all over the body, we might well think it wonderful if matter was not formed; nay, Mr Pott himself, notwithstanding the very positive assertion already mentioned, "does own that matter is sometimes discharged. If it was not, how could the bones ever become carious?"

I agree with him, however, that the opinion so long prevalent, that pus was always discharged in the fistula lachrymalis, has been the cause of many and grievous mistakes, both with regard to the nature and cure of this disease; for thus, practitioners have been deceived into a method of applying escharotic medicines, treating the cavity of the sac as an ulcer, and destroying those parts which they ought by all means to have preserved.

The fistula lachrymalis, as has been already mentioned, in the first stage of it, is not attended with either pain or other inconveniencies than an effusion of tears, which, by frequently rubbing and pressing, the sac may generally be rendered supportable; but when, by neglect or bad habit, the sac swells and bursts, it then becomes a very serious disorder. The affected part now becomes exactly like an abscess which has burst, and ignorant practitioners are apt to treat it in the manner. By degrees, however, an ulceration is certainly formed, in bad habits at least, and at length the bones become carious, which is known, as in other cases, by the discharge of a thin fœtid ichor, or they may be felt with the end of a probe. If, however, they are not affected, the small wound made by the bursting or opening of the sac commonly heals, though not permanently; for, in a few days, a  
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new swelling takes place, and the tumor bursts as before; and thus the disease goes on from bad to worse, until the bones themselves are effected, which takes place the sooner, if the constitution happens to be infected with scrophula, or the lues venerea.

From this account of the appearances of this disease at different times, it is evident that the treatment of it must vary very much in its different stages. It proceeds originally from the tears being detained in the sacculus lachrymalis by some obstruction in the nasal duct. A distension, irritation, and at last an inflammation of the sacculus, and the membrane of the nasal duct at last take place, with all the bad symptoms already enumerated. I agree with Mr Pott that the disease may properly be divided into four different stages. 1. While the bag, though swelled, continues free from inflammation, or the integuments from being discoloured, the mucus flows out upon pressure, being either quite clear, or but very little cloudy. 2. When the skin is inflamed, and the tears flowing through the puncta lachrymalia, assumes the appearance of being mixed with pus. 3. When the skin which covers the sacculus becomes sloughy and bursts, the swelling being somewhat diminished by the discharge; but, in the meantime, a constant flux of tears taking place through

through the new opening. 4. In the three former stages, the nasal duct, though much obstructed by the inflamed and thickened state of the internal membrane, is still open; but in this it is totally stopped up by fungous flesh, a grievous ulceration having taken place, and the bones become carious.

In these various stages, the method of cure must obviously be very different. While the disease is but just beginning, simply pressing and rubbing the sacculus now and then, will sometimes prevent a total obstruction. As it proceeds, we must endeavour as much as possible to ascertain what degree of obstruction is there. For this purpose, the surgeon is to introduce the point of the small syringe, represented Pl. 6. Fig. 1. is to be introduced into the small wound made by the bursting or opening of the sac, shutting, at the same time, both the lachrymal points with the forefinger of the left-hand, and pressing them against the ball of the eye, so that nothing can pass through them. We must then gently inject some warm milk and water; and, if we find that nothing passes through the nose, but that all returns by the sides of the syringe pipe, notwithstanding every care that can be taken to prevent it, we then conclude that the nasal duct is entirely stopped up; but, if it does pass, though in small quantity, and with difficulty,

culty, there are some hopes, that, by persevering in the use of the injection, the obstruction may at least be lessened, if not totally removed. The injections I have found most proper in this case, are milk and water, weak solutions of gum arabic, or decoctions of althæa root. These are much preferable to medicines of the astringent kind, for the following obvious reasons. In a healthy state of the saliva of the mouth, any small wound made in the inside of the lips or cheeks heals in a very short time, by reason of the salutary moisture continually in contact with these parts. In the nose and lachrymal duct, the same thing takes place; but, if any of the fluids secreted there, or the membranes themselves happen to be in a diseased state, the case will be far otherwise. The fistula lachrymalis originates always from inflammation in the eye itself, or in the membranes of the nose. The measles make their first appearance by a great discharge from the eyes and nose, attended with every symptom of coryza. From the measles, a fistula lachrymalis may, and often does, take its rise. The discharge may become acrid, so that the membrane of the duct may be inflamed at its entrance into the nose, and a small degree of excoriation take place; and an adhesion between the sides of it at last ensue, if the membrane happens to be so much thickened that the sides of it

it come in contact. If this adhesion be but partial, the liquid will find a passage into the nose, though with difficulty; but, if total, the total stagnation of it, with all the symptoms attending the most obstinate fistula, must be the consequence. A complete obstruction of the duct is often the case in the measles, and the same thing may happen in cataracts; and in both these cases the patient will find relief from pressure, as has been already mentioned; but it is evident that every strong astringent applied to such a delicate membrane as that which lines the inside of the nasal duct must be apt to produce inflammation, and consequent adhesion. Hence, we ought never to use injections of alum, oak bark, or even saccharum saturni; the nearer we can arrive at the mildness of the natural liquids which moisten those parts, so much the better, and the sooner will our patient be relieved and cured.

This method of curing the fistula lachrymalis by injection, seems to be disagreeable to Mr Pott. He objects to it, as well as to the use of a probe, in attempting to clear the nasal duct, and to compressing the internal angle of the eye, in order to force a passage by the lymph itself. "The syringe, (says he), if used while the disease is recent, the sac very little dilated, and the mucus perfectly clear, will sometimes be found serviceable;

viceable ; I have used it, where I think it has been much so ; I have by means of it injected a fluid through the sacculus into the nose ; and in two or three instances have effected cures by it ; but I have also used it ineffectually." He owns, however, that it gives no pain, and that the use of it soon gives little or no trouble. The syringe he speaks of for injecting through the puncta into the sacculus and duct was invented by M. Anel ; and, in another place, he says, that " he has used it successfully, and thinks it may now and then be very well worth trying, in recent cases more especially, as it may always be used without giving any pain, or running the risk of any inflammation." In my own practice I have certainly found it successful, and have cured four patients, by forcing away the obstructing matter by injection. As the nature of this obstruction, however, must be *a priori* unknown to us, it is not wonderful that the syringe should sometimes fail ; for, if the fides of the nasal duct be completely grown together, it is vain to think of separating them by means of any injection whatever that can pass through the puncta lachrymalia. Mr Pott concludes his observations on the first stages of the fistula lachrymalis with taking notice, that, " if the bag be not much dilated, the mucus be clear, and the skin and cellular membrane uninflamed, and the parts about, soft and easy, if the patient will

take care not to suffer too great an accumulation, will, by the frequent use of a vitriolic collyrium, keep the eyelids clear and cool, and carefully avoid such things as irritate the membrana narium, or occasion a sudden flux of lymph from the lachrymal gland, the disease may for years, nay often for life, be kept from being very troublesome or inconvenient, without any surgery at all." No doubt this is all very true; but, instead of being any argument against the use of the syringe, it is one of the strongest that can be brought in its favour. The pressure of the sacculus only forces the natural fluid through the nasal duct, and thus makes it operate as a mild injection. The syringe, by forcing a mild artificial fluid through the duct, acts in the same way, only a little more strongly. Where the mere pressure of the sac, therefore, now and then applied, is sufficient to keep the patient tolerably easy, we have every reason to believe that a proper application of the syringe would be more effectual, and probably remove the complaint altogether. Undoubtedly, however mild the disease may sometimes be, Mr Pott could not have supposed that any patient would grudge to have it removed by the use of a remedy, which he himself declares to be neither painful nor troublesome.

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Where the syringe proves ineffectual, recourse has been had to a probe so fine that it could pass through the nasal duct. M. Anel recommended one of this kind, passed from the eye into the nose, and the French academicians from the nose into the eye, in which way also they recommended injections to be made. But instruments of this kind seem to be much more liable to objection than the syringe. The probe cannot be passed from the eye into the nose without giving extreme pain, and by exciting a violent inflammation, may render matters much worse than before. Nay, though this objection were removed, the fineness of the probe itself renders it too weak to be of any effectual service in the removal of obstructions. Besides, the whole practice rests on a mistaken theory, *viz.* that, in a fistula lachrymalis, the ducts leading from the puncta into the sacculus are generally obstructed, whereas the reverse is the case. These ducts are seldom or ever affected; and the very nature of the disease, which shows itself by the appearance of thickened mucus passing back through the puncta, by pressing upon the tumor in the angle of the eye, is an evidence that they are open, the obstruction being always in the passage from the sac to the nose. This being the case, we might suppose that the introduction of a probe, as recommended by the French surgeons, would be more effectual; but it is evident

evident, that, to pass it in this way, must be very difficult, and frequently impracticable; so that unless, in very fortunate circumstances, and which it is impossible to know before hand, the use of the probe cannot be productive of any good consequence.

Another method recommended for curing the fistula lachrymalis in its milder stages, are the passing of a seton from the superior lachrymal point into the nose, through the sac and duct, where it is to remain, with the end hanging out at the nostril, till the cure is completed. This, however, seems to be a much more dangerous remedy than the probe; and the introduction of the cord will always be found difficult, in many cases impracticable; neither can we in any case suppose that the inflammation attending it would not be attended with the very worst consequences.

A more mild, and seemingly more effectual mode of treatment, is by keeping a constant and equable pressure upon the sacculus. For the purpose of keeping up this pressure, a kind of screw has been invented, or a compress and bandage made use of. With these, however, it is difficult to determine the due degree of pressure which ought to be kept up; nor can it in any case be very effectual in removing the obstruction in the nasal duct, which is the primary  
cause

cause of the disorder. Injections by the syringe seem to have a fairer prospect of being serviceable than pressure. Indeed, in some cases, a cure has been effected by the use of a proper regimen, and keeping the eye clean, without having recourse to any surgical assistance at all; and, in such cases, if pressure has been applied, it is probable that the cure might, without any just reason, have been ascribed to it, while the disease would have been as well removed without it.

In the more advanced state of the disease, we must have recourse to other methods than those above mentioned. When the skin is much inflamed, and the tumor considerable, it is always necessary to make an opening in the upper part of the lachrymal sac. If this is neglected, it will burst of itself, which is always to be avoided, as being attended with some loss of substance, which a simple incision is not. At any rate, this must be done; but, if the patient happens to be tainted with the scrophula or lues venerea, proper attention must be paid to those diseases, as it is vain to expect a complete cure while they continue to prevail. The incision ought to be made at a small distance above, a line drawn from the junction of the eyelids towards the nose, and continued downwards, and there is not any occasion for making it semilunar, or of any other figure

figure than straight. It may be done with the point of a common lancet, as well as with any instrument whatever. After it is made, the sac should be filled with lint, but not in such a manner as to distend it very much; and thus it frequently happens, that, if the disease be but slight, the sac will heal up with a slight dressing, and the lymph resume its usual course. Should this not succeed, we must, if possible, render the nasal duct pervious by other means. In this state of the disease, we still suppose the bones to be sound; but, indeed, if the patient happens to be of a scrophulous habit, they soon become otherwise; and the extreme thinness of the os unguis renders it unable to resist the infection for any time. At first we may attempt to break through the obstruction in a manner somewhat similar to that of removing the obstructions which sometimes take place in the urethra. This may be done by occasionally passing a probe, or piece of catgut, as far as it will go into the duct, which runs from the internal canthus down to its entrance into the nose, perpendicular to the nasal process of the maxillary bone. The directions formerly given for passing a bougie into the urethra will be particularly useful here. The intention in both is to dilate the canal, without lacerating, or otherwise injuring the texture of the parts. Dry lint, a bit of prepared sponge,

&c.

&c. will be of use as a preparatory to dilate the sac, before we attempt passing any thing into the duct. We must also remember, that it is impossible to judge of the size of the nasal duct merely by looking at the bony channel which contains it in a dry skull; for the membrane which lines it is of considerable thickness; and, when inflammation takes place in it; from any cause whatever, the hollow of the duct is either rendered very small, or shut up altogether. But, though it is necessary thus to dilate the sac, it is absolutely improper to stuff it very firmly with hard dressings. The use of the dilatation is to get easily at the duct, not to destroy the sac; and prepared sponge seems to be the best substance for the purpose. Escharotic applications of any kind are absolutely to be avoided; and the passage being once obtained, is to be kept carefully open, by means of a bit of cat-gut, or bougie, the wound being allowed to heal up, excepting what is necessarily kept open by the substance introduced.

It is a remarkable circumstance mentioned by Mr Pott, that sometimes the fistula lachrymalis cannot be cured, even though the nasal duct remains open. This would seem to intimate that the sac, in a diseased state, had lost the power of contraction. He observes, also, that, in many cases, a complete cure is effected by the method  
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here laid down; but that it is quite uncertain whether the cure will succeed or not.

In the worst state of the fistula, when the passage through the nasal duct is entirely obliterated, the only method left is to attempt the formation of an artificial passage through the bone, instead of the natural one. When this operation is to be performed, the patient must be seated in a chair opposite to a window that shows a good light, in the same manner as if the operation for extracting the crystalline lens were to be performed. If the tumor is already burst, we will always find the opening at the internal canthus of the eye upon the top of the cheek, and the sac may with ease be laid completely open, by introducing the small open pointed director made use of in herniæ. When this is done, you are next to take a probe bent to a right angle, for about an inch in length; with this you are to enter the sac, and gently elevating the hand with the probe in it, that part of it which is bent will be brought parallel to the os nasi, by moving the point gently, and searching with it carefully, this part of the probe will generally be found to pass with ease into the nose; and after it is taken out, the piece of bougie, catgut, or lead, as already mentioned, may be introduced; a piece of it being turned a little downwards, on the outside, and left in the opening.

pening. The fore must now be dressed with a simple pledget of wax and oil, which is to be retained by an adhesive plaster. The catgut, &c. must be left in the opening till such time as the sides of the duct are completely skinned over and healed ; after which they may be removed, and the wound will soon be closed up entirely. The most effectual mode of securing a free passage into the nose, is by introducing a tube of a proper size and shape into the nose, through the whole length of the duct. This, if properly executed, can never fail ; which may be easily done in the way recommended by Pellier. After laying the lachrymal sac freely open in the usual way, the natural conduit for the tears is searched for, either with a firm probe, or with the conductor, Pl. 6. Fig. 3. As soon as this is discovered, the tube Pl. 6. Fig. 4, 5. must be put on the conductor, previously filled with the compressor, Fig. 6. as represented in Fig. 7. ; they should be exactly fitted to one another, and the end of the conductor should project past the end of the tube about the tenth of an inch. The point of the conductor is now to be insinuated into the lachrymal duct, and being pushed in till it reaches the nostril, which may be known either by inserting a probe into it, or by a few drops of blood being observed to fall from the nose. The conductor being now

no longer necessary, must be withdrawn, taking care to keep the compressor steadily in the edge of the canula, which must be firmly pressed down with it in the left hand, while the conductor is removed with the other. If this precaution be not attended to, the canula would be brought out along with the conductor; but this inconvenience is in this manner very effectually prevented, while the same instrument serves more easily than any other to press the canula to a sufficient depth in the lachrymal duct, a point of the first importance in performing this operation; for, if the canula be not fixed with some degree of firmness, even at the first attempt, there will afterwards be more pain and difficulty in doing it.

This being done, the compressor is next to be taken out; and, with a view to discover whether the canula is at a proper depth or not, a little milk and water should be injected through it with a small syringe. If the injection passes freely and easily into the nostril, while the upper part of the canula is pressed down to the middle of the lachrymal sac, there will be no reason to doubt of its being perfectly placed; if, on the contrary, any obstruction occurs, there will be reason to suspect that it is already pushed too far, and that it presses against the os spongiosum inferius, in which case the canula should be withdrawn a little. As the wound in the sac will  
yield



yield a considerable quantity of matter, is is necessary to preserve it open for eight or ten days, with a bit of soft lint, spread with any emollient ointment, taking care to cover the whole with some soft linen, secured by a proper bandage. An injection of milk and water should be daily passed through the canula; and at the end of this time, or whenever the suppuration is much diminished, and the fore looking clean and healthy, the dossil of lint must be entirely removed, and a piece of court plaister laid over the fore, it may be left in this state to heal. In this way, Mr Pellier observes, every case of *fistula lachrymalis*, where the bones are not diseased, may be cured in fourteen or twenty days." Canulas also of gold or silver have formerly been introduced and left in the passage for life. In this way they may be easily as well as firmly inserted.

The worst state of the disease, is when the opening into the nose is so completely shut up that it becomes necessary to perforate the bone, in order to form an artificial passage, the natural one being entirely obliterated. In this case very rough methods were formerly used, and the application of the actual cautery has been recommended even as by Mr Cheselden. It is evident, however, that the only good which can be done by this instrument is to make a passage  
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through the bone ; and this it cannot effect without much more pain to the patient, as well as danger to the adjacent parts, than is to be apprehended from any other. The only thing requisite here is to make a perforation through the os unguis, and membrane of the nose, and to keep that perforation open as a passage for the tears, after the external wound is healed. In this we should think, that very little difficulty would occur. The extreme thinness of the bone occasioning very little resistance to any instrument that can be applied ; and the same circumstance renders it very probable, that, when this artificial passage does fill up, it is not by bone, but by a thickening of the membrane of the nose. The only thing, therefore, requisite on the part of the surgeon, is to make the opening of such width that it cannot soon be choaked up. When this operation is to be performed, the surgeon must stand behind the patient, and push the small trocar represented Pl. 6. Fig. 2. fairly into the opening in the bony canal, turning the point obliquely downward and backwards. Thus, an opening will be made in the back part of the groove of the os unguis near its middle, in a slanting direction downwards, boring, as it were, gently through the bone. After the trocar is removed, we must introduce a small bougie through the opening, and keep it there until the wound be completely

ly healed. Some practitioners recommend the introduction of a tent immediately after the perforation, the end of which is to be moistened with vitriol acid, or the introduction of a bit of lunar caustic, all covered, except a small bit at the extremity, with which the edges of the opening are to be touched, in order to prevent the granulations of flesh from growing and filling it up. But this, as well as the cautery, seems likely to put the patient to a great deal of unnecessary pain, and therefore the use of the bougie in my opinion is to be preferred. In this way I have performed the operation upon two people, who have continued perfectly free of the disease these four years.

## CHAP. XIV.

*DISEASES OF THE NOSE AND MOUTH.*

## SECTION I.

*HÆMORRHAGES FROM THE NOSE.*

THIS disorder, called also epistaxis, is generally thought to be but of little consequence, yet in some cases it arises to a very great and alarming height. It may arise from various causes. In patients from twenty to thirty-six years of age I have seen it arise from plethora in the vessels  
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of the part ; or it may arise from a rupture of the vessels. The effects of both these causes may be augmented by a particular habit of body, as where the patient is of a relaxed habit of body, or the crasis of the blood in a thin and dissolved state ; and hence, in the scurvy, in nervous and putrid fevers, in the advanced state of the jaundice, and in all bilious complaints, when arisen to any height, the patient is in danger of an hæmorrhage from the nose, which will be more or less violent in proportion to the degree of thinness and acrimony of the blood. In such cases, we must by all means apply the remedies which are necessary for removing the primary cause of the disorder, without which all external application must be useless. In young and strong people, where the hæmorrhage proceeds rather from excessive vigour than any thing else, it is very often salutary ; but, in all cases where the attacks are frequent, and the discharge copious, it is necessary to have recourse to internal medicines, as well as external applications. In slighter cases, it will be sufficient to apply cold applications, such as wet clothes, &c. to the neck, which, by the sudden contraction they naturally occasion in all the adjacent vessels, soon put a stop to the hæmorrhage ; but, where these prove ineffectual, and the bleeding frequently returns with violence, other methods must be taken.

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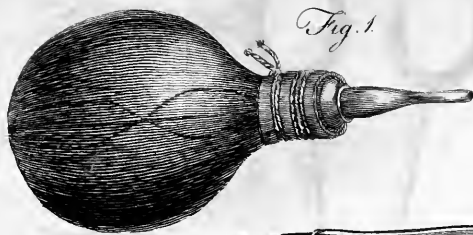


Fig. 1.



Fig. 2.



Fig. 5.

Fig. 3. Fig. 4.



Fig. 7.



Fig. 8.

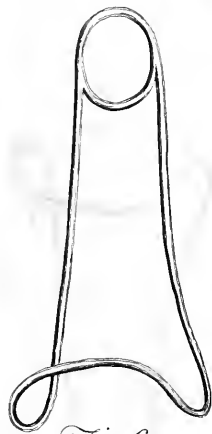
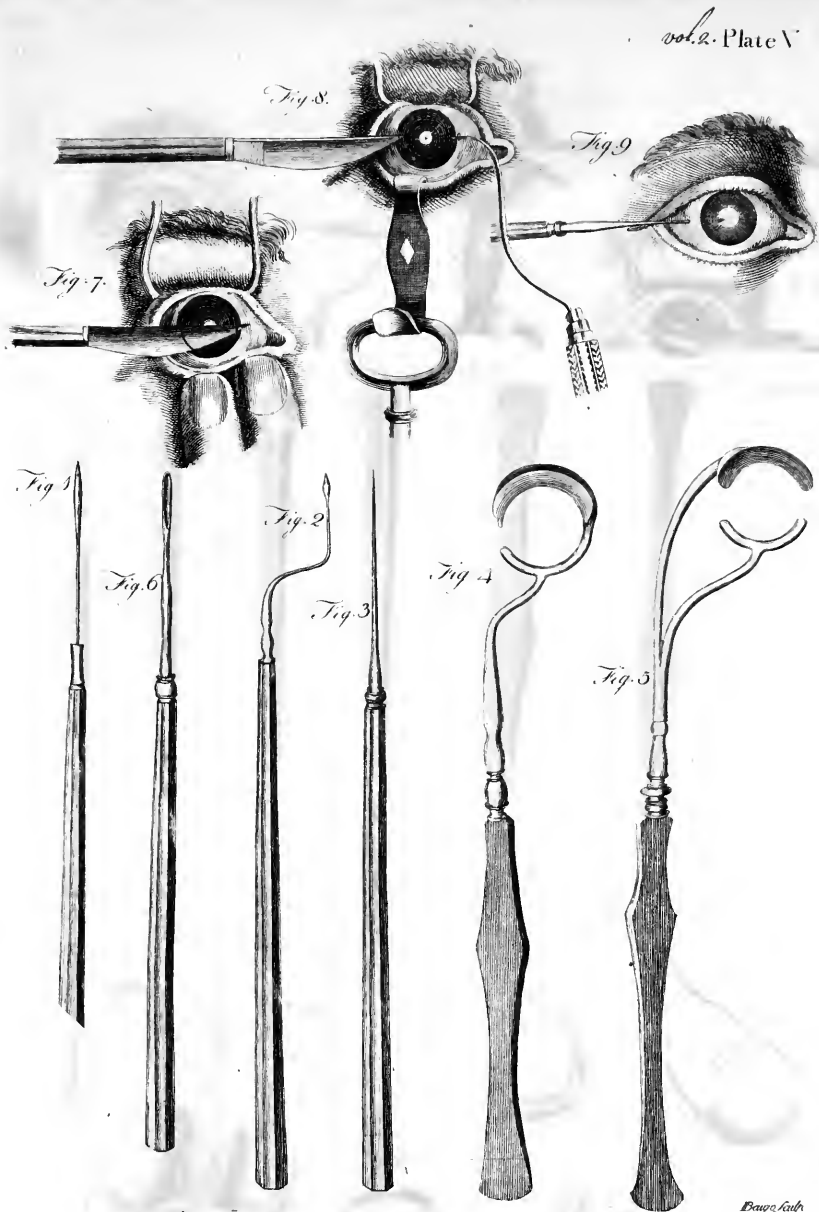


Fig. 6.



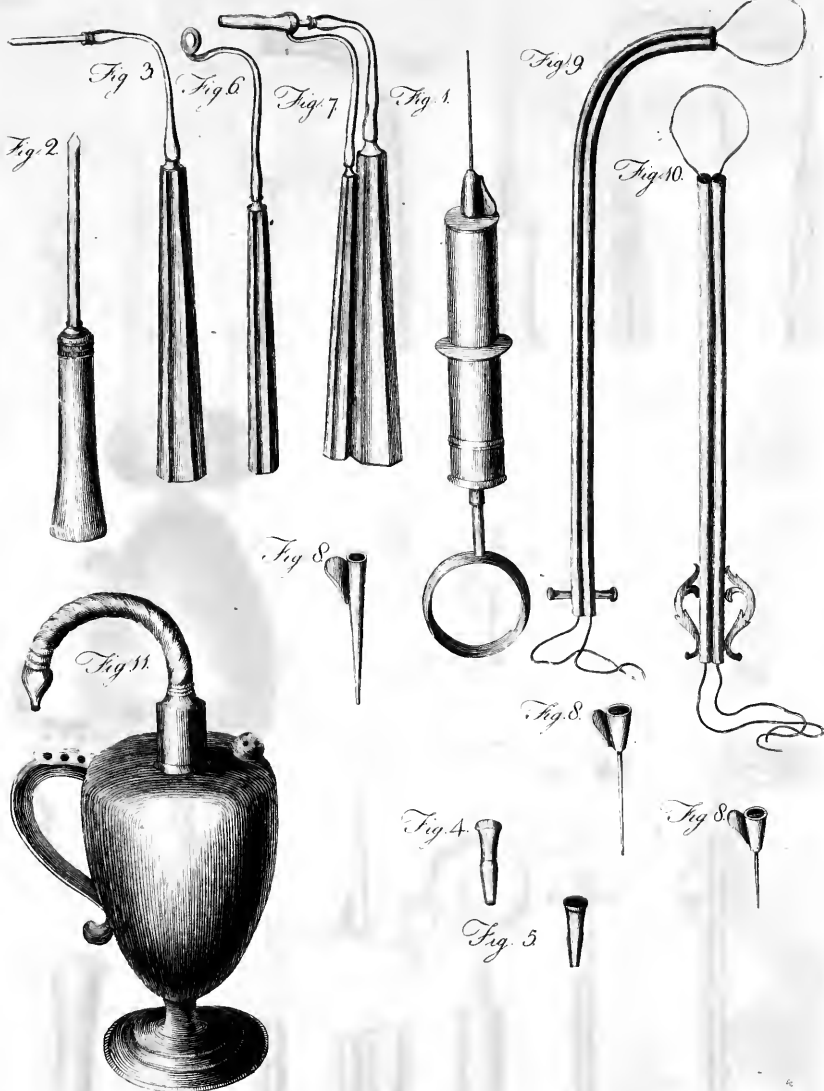
Fig. 9.

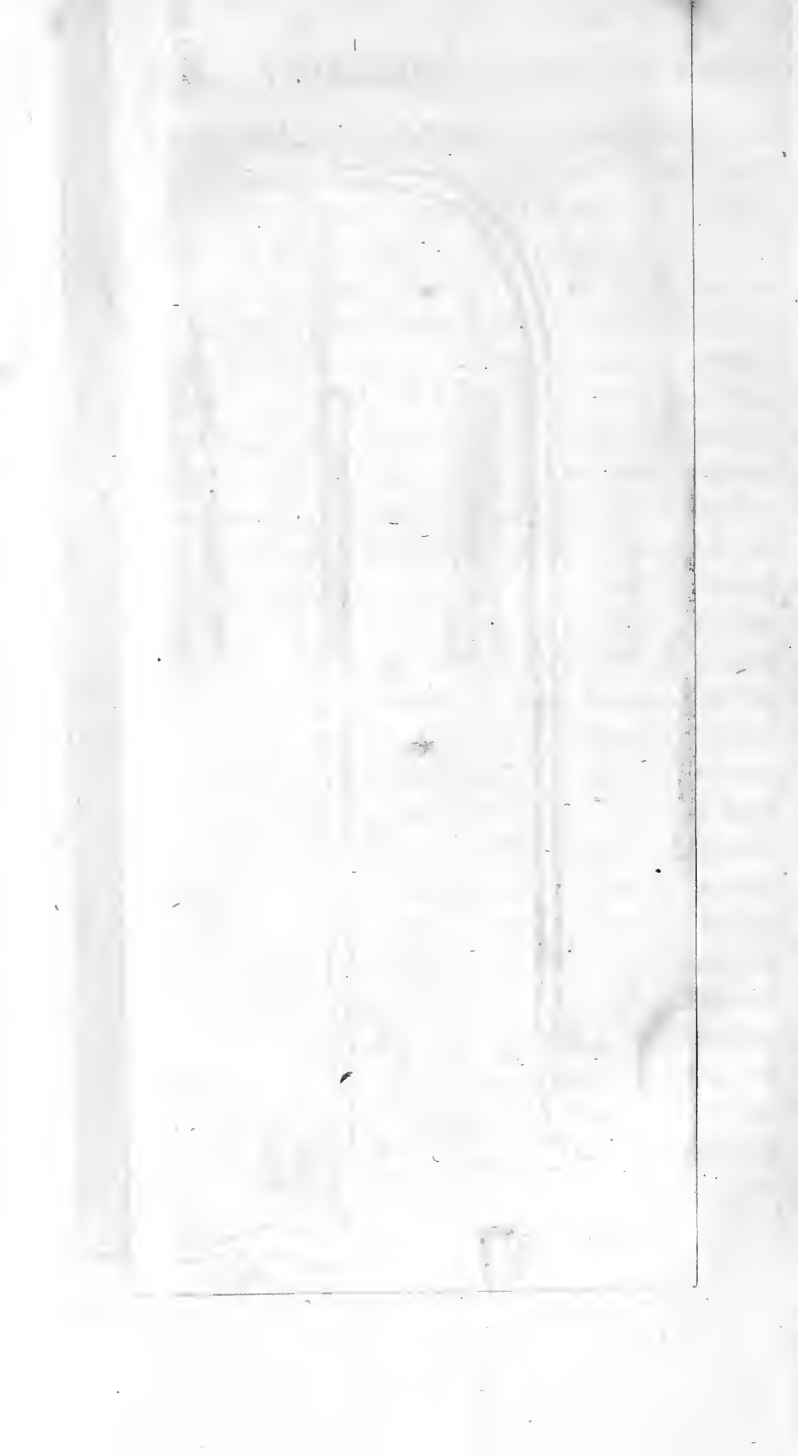












He should have a large and well aired room, and his clothing should be very light; his diet also light, and cooling; neither should he taste either food or drink warm. Externally he ought to have cloths dipped in a mixture of equal parts of vinegar and water applied to the nose and cheeks, to the forepart of the neck, along the carotid arteries, and to the back part of it, to check the course of the blood in the vertebral arteries. During the time of the flux, he ought frequently to fill his mouth with cold astringent liquors, which will answer all the purposes of a gargle, without the inconvenience occasioned by the convulsive motions of the muscles serving for deglutition, which that remedy occasions, and which cannot fail to increase the disorder.

Thus, in most cases, a bleeding at the nose may be stopped; but, should every thing of this kind fail, we must have recourse to cooling or astringent injections. To accomplish this, the patient must be laid upon his back, across two chairs, with his head hanging over, in which position his nostrils may either be filled, by means of a syringe, or by pouring it into them, a mixture of two parts of vinegar, and one of water. Thus, the cold liquor comes immediately in contact with the bleeding vessels, and generally puts a stop to the hæmorrhage; but, should it still prove otherwise, (a case I never yet met with), we must proceed.

ceed in the following manner. Having filled the instrument, represented Pl. 6. Fig. 8. with a piece of fine catgut, or waxed thread, the surgeon is to introduce it through the nostril, from which the blood flows into the fauces, when, upon causing the patient open his mouth, he must pull out the end of it by a pair of common dressing forceps. Taking hold then of the end which is brought out at the mouth, the operator is to withdraw the instrument by which it was introduced. A bolster of soft lint is then to be fastened to the part which comes out at the mouth, of such a size as is sufficient to fill the posterior opening of the nostril, and pulled firm into it by the other end; a piece of catgut is to be left hanging out at the mouth, in order to withdraw the lint, when the cure is completed. By turning the head backwards and downwards, we may then fill the nostril with any astringent injection, by means of a syringe, or otherwise. Thus, may any hæmorrhage of the nose be stopped, or any ulcer in that part cleaned, to much more advantage than by putting doffils of lint, dipped in astringent medicines, up the nostril; for thus it is impossible to prevent them from passing into the throat and stomach, where their action may not always be agreeable.

## SECTION

## SECTION II.

*OF THE POLYPUS OF THE NOSE.*

THE name of polypus is given to a kind of tumor arising in the back part of the nostrils, sometimes of such a small size as not to be perceptible externally; at one time making its appearance out of one of the nostrils, at another time in the fauces. They generally begin with a difficulty of breathing in one of the nostrils, which continues to grow worse, until at last a tumor becomes evident. By degrees, this fills the whole cavity of the nostril, and either pushes out through it externally, or backwards into the fauces, until at last it appears to fill the whole throat. The increase of the tumor is sometimes very slow, and patients will be affected with them for a great number of years, without feeling any other inconvenience than the difficulty of breathing through one of the nostrils. Young people, even at the age of twenty, are frequently affected with them, and continue to feel little inconvenience, except in breathing or smelling, till they arrive at the age of about thirty-six. In the beginning of the distemper, the tumor is soft, and of different sizes at different times. In moist weather, it com-

monly swells, but returns to its usual size in a contrary state of the atmosphere. At the time of life just mentioned, even the mildest polypus begins to assume a more malignant appearance. It loses its soft consistence, becomes hard at all times, changing their original pale colour to a red, and distending the bones of the nose and fac to a great degree, affecting them also in such a manner that they are not only disjoined, but dissolved. In some patients, the polypus is of a deep red, and of a firm texture from the beginning. They increase with much greater rapidity than the former, until at last, having disjoined and destroyed the bones, as already mentioned, that part of the tumor which appears out at the nostril becomes excoriated, painful, and breaks in several places, degenerating very quickly into a cancerous mass. Polypi of this kind do not commonly appear in people under thirty-six years of age.

From this account of the polypi, it is evident, that, though all of them go under one general name, they are nevertheless essentially different, at least for some time. The milder kind, as has been just mentioned, are of a pale or light brown colour, give little or no pain, even when pressed; they increase and decrease according to the state of the weather, and can be made freely to descend through the nostril. A clear lymph  
distills

distills from this kind upon pressure, by which they are also generally rendered flat. The malignant kind are preceded by a considerable degree of pain in the forehead, and upper part of the nose, and, as soon as visible, discover a high red, or purple colour. The patient also feels pain when he coughs, blows his nose, or sneezes; and, when touched, even though slightly, they bleed. This kind never vary their size; nor do they appear moveable by blowing the nose or otherwise. To the feel they are excessively hard, and, when pressed, give pain in the angle of the eye and forehead. If any thing is discharged from them, it is either blood or an ichorous sanious matter of a bad colour. These soon arrive at the fatal termination already mentioned, which indeed is that of all polypi whatever, a circumstance which ought more carefully to have been taken notice of, and remarked by writers on surgery than it has been.

These tumors commonly arise from the membrane which lines the nose, particularly that part of it which covers the ossa spongiosa inferiora. They seem to be peculiar to those parts whence slight hæmorrhages are wont to flow; and hence, they are met with only in the nose and vagina. It is also found, that those who in their youth, have been subject to slight hæmorrhages, are almost liable to be affected with polypi

lypi, either in the nose or vagina. In both these parts of the body, indeed, the polypi are frequently attended with loss of blood ; and hence we know, that any disease which tends very much to relax and weaken the general system, must also tend to produce a polypus. Irritating and very stimulant medicines may also do the same ; whence we see, that it may be brought on by mercury, which operates so powerfully upon the nervous and salivary organs, particularly if the patient has caught cold. Mr Pott remarks, that they who have the milder kind of polypus, generally complain before the distemper becomes visible, and that for a considerable time, of frequently catching cold, especially in damp and wet weather ; and in these supposed colds, they always complained of want of smelling. They had also frequent fits of sneezing, with a considerable discharge of mucus from the affected nostril. These symptoms I have also remarked, and in four cases which fell under my observation, all of them young men, they assured me that the symptoms came on immediately after they had been laid up in a salivation. For some time after that, they complained of a difficulty of breathing through one nostril ; and, when they wished to clean their nose, frequently felt something stop it up altogether. I am of opinion, therefore, that these  
hard



hard and fleshy tumors arise most commonly from a diseased state of the membranes. It is the tumor itself, however, that affects the bones in the manner above mentioned. Polypi of the uterus are not connected in the inside with any bone, and therefore cannot produce the same effects. In the nose, in short, they arise from the membrana pituitaria; and by neglect in the patient, and I am sorry to say, frequently in the surgeon, they are allowed to grow to such a size, that the bones themselves come to be affected. If the patient, however, comes to the surgeon otherwise in good health, when the swelling is small, regular and void of pain, without any discharge of blood or matter, there cannot be any doubt that a cure may be accomplished, not only without any injury to the patient, but without subjecting him to an hour's confinement. But, if matters have been so far neglected, that the bones of the nose have become diseased, so that they are open and soft, with the tumor projecting irregularly through the nostril, and discharging foetid matter, we will in general find that it has destroyed the vomer, ossa turbinata, spongiosa superiora et inferiora, &c. though we must remember that none of all this is the cause, but the effect of the disease.

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There are two methods of curing the polypi; one is by pulling them away with a pair of forceps, the other by putting a ligature over their base, bringing it upwards to the neck, and there twisting it tight, so as to destroy circulation, in consequence of which, the tumor soon falls off. We are not however, at all events, precipitately to attempt the removal of every polypus, without examining the nature of it. Those which it is proper to attempt the removal, are of the mild kind already mentioned, and about the lower part of which a ligature can easily be passed to some height. These which are of the most benign nature generally adhere by a peduncle or stalk of a small size in comparison with the polypus itself; but there are others also of a mild nature, and which may be extracted, though with more difficulty, yet without any danger. They differ from the former only in being larger, and adhering more firmly. The malignant polypi have also been described, and cannot be removed with any probability of success. In all cases, indeed, the cure must be uncertain, for the total removal of the tumor depends in a great measure on the quantity of surface attached to the membrane of the nose, as well as on the nature of the disease; and the polypus is also a disease of itself, exceeding apt to return, especially that which arises from the  
ossa

A: Septum Nasi.

B: A Polypus. towards the Palate

C: The Palate.

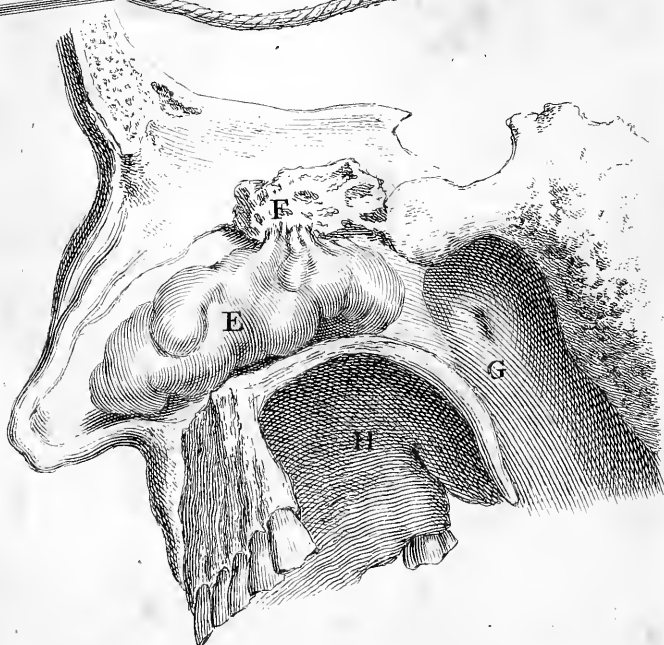
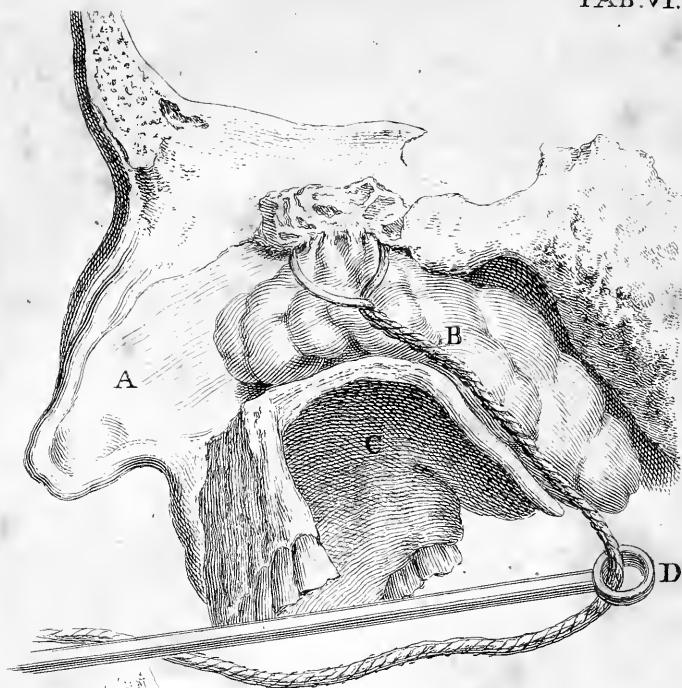
D: An instrument to direct  
the application of the ligature.

E: A Polypus in the Nostril

F: Os Spongiosum.

☒: Iter ad aurem. G:

H: The Palate.



ossa spongiosa. Frequently, there are two or three of these tumors, each of them totally distinct from the other, so that when one has been removed, another has quickly succeeded.

When a polypus is to be destroyed by ligature, the patient must be seated in a well lighted room opposite to the window, with his head turned back, so that the operator may have a distinct view of the tumor. He is then cautiously to introduce a piece of silver wire or catgut doubled into the nose, till the bend in the middle of it is got behind the tumor. He is then to push it up over the basis of the tumor to the neck, and then introduce the two ends of the wire or catgut into the double canula, which is to be inserted into the nostril, and the wire tightened firmly, by pulling it close to the end of the canula, within the nose, and rolling it round the end of it, without the nose, so as to keep it firm. The latter must be left in the nose, and in twenty-four hours the wire or catgut is to be tightened a second time. Thus, we may extirpate every polypus, the size of which is so small, that it does not extend backwards into the throat. But, when the tumor comes to be so large that it hangs back into the throat, and has largely connected itself with the ossa spongiosa, the doubled wire or catgut must be pushed gently through the nostril, until it appear in the throat; after which, the surgeon is to open the double,

so far that he can put it over the tumor with the forefinger of his left hand, when keeping it in this situation, with his right hand he gently pulls the ends towards him, till with the finger of his left hand still directing him, he becomes certain that the neck of the tumor is entirely surrounded. When this is done, the cord or wire must be passed through the double canula, which is to be pushed into the nostril, and fixed as before, until the polypus drop off. The canulas proper for the purpose of extracting polypi, are represented Pl. 6. Fig. 9. 10.

Thus, we may safely, and without much pain to the patient, extract every polypus which it is safe to meddle with. I do not, however, recommend this, or any other method of extirpation, to be followed with those which adhere by a broad and firm base, and show any signs of malignity; for, if any violence be offered to them, the most violent inflammations, pains, hæmorrhages, and other dangerous symptoms may be expected, not only without doing the patient any good, but certainly accelerating his destruction. The method of extirpating polypi by ligature, I certainly prefer to that of extracting them by the forceps; for, as this last can only be done by violently tearing them away, frequently by piece meal, it is impossible but the patient must be put to much more pain than in  
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the other method. In this, however, I have the misfortune to differ from Mr Pott, who prefers the forceps to the ligature, though without assigning his reasons particularly. Speaking of the attempts which have been made to destroy polypi by caustic, “The method of ligature, (says he), whether by silk or wire, is not attended with the inconveniencies of the caustic, and is certainly practicable in some instances; but, as far as I have seen of it, is by no means equal to that by the forceps, either for its general utility, or for its capacity of perfectly eradicating the excrescence. I know some ingenious practitioners who approve of it, but I cannot say, from what has come within my knowledge, that it appears to me in so recommendable a light.” In my practice, however, I have always made use of the ligature with success, and have no reason to doubt of its being equally successful in all cases where extirpation is practicable.

When a polypus is to be extracted by the forceps, the patient must be seated as for the ligature, with his head held back, and secured by an assistant, the surgeon endeavouring to get as full a view of the tumor as possible, in order to discover the root of it; for, as in the case of ligature, it is necessary to tie as close to the root as possible, so in that of forceps, it is equally necessary to lay hold of it as close as possible to the

root. The surgeon is then to introduce into the nose a pair of proper forceps; and, having taken hold of the tumor as high up as possible, he turns them gently round, twisting off the tumor gradually from its root. Thus, in favourable circumstances, we may at once extract the polypus, and free the patient from the disease, without any hæmorrhage of consequence, and with very little pain. In many cases, however, by reason of the softness of its texture, or degree of firmness in its adhesion, the polypus breaks, so that we must pull it away at different times. This is a disagreeable circumstance, not only on account of the pain and hæmorrhage it occasions, but by reason of the impossibility of extracting it completely after once it is broken. Hence, it has been recommended to pass a seton through betwixt the mouth and nose, by means of which such escharotics and other medicines as may be thought proper can be conveyed to the remains of the tumor. With regard to the use of caustic, or strongly escharotic medicines, however, we must easily see that it is liable to the same objections after the tumor is broken, which lie against it when it is whole. The extreme sensibility of all the inside of the nostrils, and the irritability of the tumor itself, shows the danger of applying any thing of an irritating nature. Instead of such applications, therefore, we



we ought to make use of the most mild ointments, so that the tumor may gradually be dissolved by a gentle suppuration. In all cases, however, we must remember that it is impossible totally to destroy the irritation occasioned even by a seton, so that it is unsafe even to have recourse to that remedy, unless in cases of absolute necessity.

In favourable cases, there is, as we have said, very little danger of an hæmorrhage, though it is evident, that, where the extraction by the forceps is performed, there must always be a loss of blood, less or more, according to circumstances, which, in the method by ligature, is entirely avoided. If the bleeding is not very great, it may be allowed to stop of itself, the patient hanging down his head that the blood may flow out at his nostrils. Instances, however, have occurred of the most violent and even fatal hæmorrhages having taken place, by attempting to extract polypi which ought not to have been meddled with. In such unfortunate circumstances, the only thing we can do is to apply the ligature with a doffel of lint fastened to it, as directed in the case of a natural bleeding at the nose. Thus, the blood will be prevented from flowing back into the fauces; and, by means of filling the nostrils with any astringent mixture, it may also be kept from getting out there, if the nostril is plugged with a doffel, until it coagulates,

lates, and the vessels thus have time to heal up below it. When the polypus happens to be very large, even though it should be of the favourable kind, it is extremely probable that it may break; and, in this case especially, caustic and escharotic medicines have been recommended, and instruments invented to convey them to the remaining part of the tumor, without injuring the adjacent parts; but, though thus we may avoid one inconvenience, that which results from the action of the caustic upon the polypus itself must still remain, so that in every instance, we must see that the use of caustic in any mode we can employ it is ineligible, and that the mildest medicines only are to be made use of. One of the safest, and probably the most effectual method we can use, is to employ a large bougie, by which the obstruction in the nose may be removed as effectually as in the urethra, by means of the same instrument. It is also probable, that, if any method of preventing the farther growth of polypi exists, the introduction of a large bougie into the nostril, while the tumor is yet but of a small size, must be the most likely to accomplish it. I have not, however, had any opportunity of making trial of this in my own practice.

Le Dran mentions a kind of polypus which cannot admit of extraction, and is formed by a thickening

thickening and enlargement of the pituitary membrane on one or both sides of the nose. Of this he had seen only two instances. In one, the thickening was upon one side of the nose, in the other on both. With these patients, he tried injections of various kinds without effect, on which he had recourse to the following method. He passed a small catgut along the arch of the palate, almost as far as the uvula. By the swelling of this, the passage was made somewhat more free; and after some time, other pieces of catgut, larger than the former, were introduced, until at last he introduced as many as in all were equal in size to a common quill. Thus, a passage was made through the tumor, and the patient breathed freely while that remained open; but, so apt was it to be closed up, that all the relief he could obtain was to keep the passage open during the day, and shut it while he slept. Dr Richter makes mention of a patient afflicted with a polypus, in which he made a hole with a red hot trocar. Thus, he breathed freely, and without inconvenience; but the Doctor was prevented, by the man's going into the country, from any attempt to complete the cure.

## SECTION III.

*OF THE ENLARGEMENT AND EXTIRPATION OF  
THE TONSILS.*

THESE glands are situated, one on each side of the throat, just behind the velum pendulum palati. In their natural state, they are of a soft and yielding texture, and sometimes of such magnitude as almost to fill the whole throat; and having in them, at the same time, a number of excavations on their surface, they are sometimes thought to be diseased and ulcerated, when in truth they are not. Young people of a plethoric habit are often afflicted with a cynanche tonsillaris; and, in these, even when not afflicted with the disease, we sometimes find the tonsils so much augmented in size, that the passage for food, as well as air, is almost totally shut up, and some method of relief becomes absolutely necessary to preserve the patient's life. In this situation, the tonsils are commonly said to be schirrous, though there is reason to believe, that, for a long time, they have no tendency to this, for these swellings are never attended with any pain, but in case of inflammation; and, whenever this ceases, the pain also goes

goes off, no bad symptom remaining but the difficulty of breathing and swallowing. In two cases, however, which fell under my consideration, where there was a cancer in the throat, I found that the disease had certainly originated in the tonsils. In one case, it arose on the right side, and spread across and downwards, until all the parts about the tongue and top of the throat were totally destroyed. In the other case, the first symptoms of pain and ulceration made their appearance in the left tonsil. Both these patients were above sixty years of age; from their youth they had been subject to frequent and severe attacks of the quinsy, and the tonsils had been long in a state of tumefaction.

It has been generally remarked, that the swelling which takes place in consequence of an enlarged tonsil never returns after that tonsil has been extirpated; and this has been supposed an additional argument against their never being of a schirrous nature. This, however, has been denied, and instances adduced where a relapse has taken place here, as well as in other schirrous tumors; but the truth seems to be, that, though the instances of true schirrus in the tonsils are rare, yet there is a possibility of its taking place there, as well as in other glands. If the tonsils are removed before the  
true

true schirrus has taken place, or before it has affected any thing but the gland itself, there is no reason to think that it ever will return ; but, if otherwise, if the extirpation does not take place till after the cancerous swelling begins, or if the tumor has originally been of a cancerous nature, there is not a doubt that it will be as liable to return, as if it had taken place in any other part of the body. As soon, therefore, as by the enlargement of these glands, deglutition or respiration becomes any way impeded, they ought to be extirpated, because the operation may be performed without any danger to the patient, and we thus have a certainty, or the very next thing to it, that the patient will be finally relieved.

The methods proposed for the extirpation of enlarged tonsils, are as various as the nature of the operation can admit, *viz.* the cautery, actual and potential, a chirurgical operation by the knife or scissars, and the ligature. Of these, the last is the only one that can in this case be admitted. The cautery can never be applied here to any purpose, without destroying indiscriminately the sound parts as well as the diseased ; and, if we extirpate them by excision, there is great danger of excessive or even fatal hæmorrhages taking place. In this operation, the ligature

ture may be, as for polypus, either of silver wire, or catgut. A piece of either of these substances, of a proper length, is to be doubled and passed through the nostril on that side on which the tumor is, until the bend appears in the throat; and, as soon as he sees this, the surgeon must open it with his fingers to such a width, that it may be easily slipped over the tumefied tonsil to the very root. In this situation he must preserve it, until an assistant can introduce each end of the wire into a canula, which canula must be pushed along the doubled wire through the nostril, until the surgeon can feel it with the point of his finger, just upon the upper part of the root of the tumor. He is then to keep the canula firm in its place with one hand, while, with the other, he pulls the wire through it, until at last the whole is secured by tying the wire very firmly round the end of the canula. Thus, the wire being fixed round the root of the substance of the tonsil, will impede the circulation through it; and, being tightened every twenty-four hours, the tonsil will generally drop off in three days or four at farthest. If both tonsils happen to be affected, the same method is to be followed with the other; only it will be necessary to let the pain and inflammation attending the first operation go off before we meddle with a second; or, if the patient can respire and swallow

his food with sufficient ease, it will be unnecessary to meddle with any second operation.

In the extirpation of the tonsils, as well as of the polypus, we may evidently lay it down as a rule, that the narrower the neck is, by which it adheres to the throat or inside of the nose, the more easily we can make the ligature round it. In the case of the tonsils, however, there can seldom be much difficulty, because we may always have access to the tumor with our fingers. Mr Cheselden, indeed, proposed, when the tonsillary tumor was very large, and the base broad, to employ a kind of needle, by which a double ligature being passed through the tumor, it might be tied in two places, by the assistance of the instrument just now mentioned. But, though there is no doubt of the practicability of Mr Cheselden's method, it must undoubtedly be very painful and troublesome; and the best practitioners agree that they have never seen any occasion for it.

#### SECTION IV.

##### *OF THE EXTIRPATION OF THE UVULA.*

THIS operation becomes necessary, when the uvula is, by frequent inflammation, or other causes, so affected, as to become permanently tumefied, or elongated to such a degree, that deglutition



deglutition is impaired, or by its passing down the oesophagus, cough, reaching, or vomiting, may be occasioned. In slight cases of this kind, we may use astringent gargles, composed of infusion of rose-leaves, with alum or vitriol, tincture of bark, or kino, &c.; but, when these fail, we must have recourse to extirpation. This, as in the former cases, may be done by excision, or by ligature; and each of these have their advantages and disadvantages. By the former, the patient is relieved at once, while the ligature is in some danger of slipping, cannot be easily applied, and is very slow in its operation. On the other hand, though hæmorrhages do not commonly attend the extirpation of an enlarged uvula, yet, when its vessels are much enlarged, they must necessarily be supplied with an unusual quantity of blood, and of consequence the patient will be in danger of an hæmorrhage. In general, therefore, where the uvula is only elongated, without much tumefaction, we may safely make use of the scissars; but, where it is greatly enlarged and swelled, a ligature will be more proper. When it is elongated, and lies upon the root of the tongue, we may successfully use the common scissars. It is, however, apt to slip out from between the blades of the scissars; and therefore the point of it must be fixed with a fine sharp dissecting hook. The hæmorrhage, if any way alarming, may be stopped,  
by

by touching the parts with the vitriolic acid, diluted in the proportion of seven parts of water, to one of the acid. The tongue, during the operation, may be kept down by a common folder, the teeth being separated by a cork placed near the angle of the jaw, which the surgeon may tell the patient to bite as hard as he pleases. Thus, the patient will at once be freed from every inconvenience with very little pain; but, if it be thought proper to employ the ligature, there seems to be no necessity for a canula, as in the case of tonsillary tumors; it will be sufficient to introduce the ligature with the fingers, and to tie it with them and the instrument above mentioned. Various instruments have been invented to accomplish this purpose; but, as none of them seem to me to be of any real utility, I have not thought it worth while to give any description of them.

## SECTION V.

### *OF THE RELIEF WHICH MAY BE AFFORDED IN DISEASES OF THE THROAT, BY EXTERNAL REMEDIES.*

THE means by which distempers of the throat may be relieved, without having recourse to any surgical operation of consequence, are three, viz. gargles, fomentations, in which class we include

include vapour baths of different kinds, and scarifications, or topical blood-letting. Gargles are of use for cleansing the fauces from thickened mucus or other fordes; and they may also be of service as topical remedies, in cases of ulceration, &c. In relaxation of the parts, they may be used with success, when made from astringent materials, as was observed in the case of an elongated uvula. Fomentations are outwardly applied for the same purposes as in other parts of the body; but, in cases of catarrh, of cynanche tonsillaris, and other diseases where the throat is subject to inflammation, the immediate application of the steam of warm water, or the vapour of vinegar, to the parts affected, is found preferable to any thing that can be applied to the outward part of the throat. Various instruments have been contrived for the purpose of conveying steam easily to the patient's throat, without putting him to any inconvenience in the using, but none of them can be compared with that called the *inhaler*, invented by Mr Mudge of Plymouth, and represented Pl. 6. Fig. 11. The method of using it is evident from an inspection of the figure. By this the inside of the mouth, fauces, trachea, and even the lungs themselves, may be fomented, while the patient lies in bed, only by taking in his mouth the end of the flexible pipe, and drawing  
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ing in with his breath the steam of the hot liquid through the body of the vessel.

In the cynanche tonsillaris, or quincy, the patients are often greatly relieved by having blood drawn from the parts immediately affected, or those next to them; or sometimes it may happen that the inflammation, by reason of the neglect of proper means to resolve it, has proceeded to suppuration, and thus the abscess requires to be opened. Where topical blood-letting is wanted, recourse may be had to scarifying with a common lancet, the tongue being all the while kept down by a spatula. For making the scarifications, we must place the blade of the lancet, so that it makes a straight line with the scales, and then with the fine point we can repeatedly make small openings in the back part of the fauces, or in such parts as are the most inflamed and prominent. The discharge of blood may be promoted, by causing the patient fill his mouth with warm water, laying his head a little backwards, and repeating this frequently. If an abscess has been formed, we may evacuate the contents of it in the same manner; but, for such patients as are timid, and cannot bear the sight of a lancet, we may use the instrument represented Pl. 6. Fig. 12. It is no more than a lancet pointed trocar in a canula, which is to be applied exactly as the ordinary lancet.

SECT.

## SECTION VI.

*OF THE OZAENA, OR ULCER IN THE NOSE.*

**B**y the term ozaena, we denote every ulceration which takes place in the inside of the nostrils, from whatever cause it may arise, or to whatever state the parts affected may be reduced by it. In every catarrh, a slight inflammation of the internal membrane of the nose takes place, but for the most part this soon goes off. Sometimes, however, the discharge not only continues, but increases, and alters its nature to such a degree, as to produce an ulceration of the parts over which it passes. An ozaena, therefore, is very frequently the consequence of cold, or it may also be the consequence of blows, or other injuries done to the nose or parts adjacent, which may bring on an inflamed state of the membrane just mentioned. The same thing may take place from the application of acrid or irritating substances, for all of these produce a temporary inflammation; and, if this inflammation be very great, the discharge may become permanent, and at last produce an ulceration; or, if the stimulus applied be excessively strong, it is possible that some degree of ulceration may take

take place at once, and the discharge be a consequence of it.

In the most simple state of the ozæna, when the discharge occasioned by a catarrh is observed to continue after the other symptoms are entirely gone; or if, from a bruise, it continues after the inflammation occasioned by the latter is quite abated in every other respect, we may hope for a cure by astringent applications to the inside of the nostrils. I have even frequently seen a blister applied to the affected side with such success, as to cure the disease at once, and, in another case, by its being kept open for a week or two with mild issue ointment. During this time, however, should the matter prove foetid, so that we have reason to believe that there is an affection of the os spongiosum inferius, which is frequently the case, we may inject into the nose some lime water, a weak solution of saccharum saturni, or an ounce of tincture of bark mixed with two ounces of water. A mixture of brandy and water, decoctions of walnut tree leaves; of oak bark, a weak solution of alum, and other astringents may be used; but, though some in this case recommended the application of these upon dossils, we may assure ourselves that there is not any method by which an ulceration in the nose can be so readily cleaned, as by injecting with the syringe. This I know from long  
1 experience;

experience; and it is the same with ulcers in the back part of the throat. I have always found that they were more effectually cleaned by injections with the syringe, than by all the gargles I could contrive. Instead, therefore, of stuffing the nose with doffils dipped in these, or any other astringent liquors, we ought to wash it gently four or five times a-day, in the manner already directed. Should any styptic, or stronger astringent than those above recommended be found necessary, I have constantly found that a drachm of the common styptic powder, dissolved in four ounces of water, proved a safe, efficacious, and never failing remedy.

When we find a thin fetid matter discharged in plenty from the nose, we may be assured that the bone is carious in some part; and of this we will always be sensible by the application of a probe. A caries, however, seldom takes place in the bones of the nose, unless from a venereal cause; and I have once or twice met with it from an improper treatment of that disease, by giving mercury in too great quantity. Thus, a very high degree of salivation was excited; the consequence of which, when long continued, was an inflammation and excoriation of the mouth and back part of the fauces, insomuch that at last that part of the vomer which rests upon the azygos process of the sphenoid bone was denuded, and

became carious, which affection was quickly communicated to all the spongy bones. The best remedy I ever met with, in a case of this kind, is a solution of one grain of corrosive sublimate, and two of crude sal ammoniac, in one ounce of rose-water, the nose being well washed frequently through the day with this, as already directed, and two small pledgets spread with fine white ointment, put within each nostril, after each washing, to prevent the excoriation. Thus, the patient will generally be cured; but, should it happen otherwise, we must next enter upon a gentle course of mercury, until we are sure that every venereal taint is removed.

Where there is a suspicion that the distemper has arisen from venereal infection, I have found the greatest benefit from an injection of two drachms of the unguentum citrinum dissolved in an ounce of fine oil, the patient's head being held backwards, and the injection retained as long as possible. From the narrowness of most peoples nostrils, indeed, it must be evident that no fore which takes place within the cavity of the nose can be so properly dressed as by injections; and if, as is sometimes the case, we find it necessary to make use of precipitate, or any other mild escharotic, we must mix it with oil, and apply it in the same manner; but the discharge will not entirely cease, until the diseased



seafed bone is removed. It is fomewhat difficult, however, to get the injections properly retained; and poffibly this difficulty may have occafioned ointments to be more frequently recommended than otherwife they would have been. The beft method I have found to answer this purpofe, is to caufe the patient lie on his back, with his head hanging over a chair; or, if he is in bed, two pillows may be put below his neck, fo that his head may, as it were, hang over them; and thus every injection will of itfelf fall down upon the affected parts of the nofe, and produce its effect more speedily, than in any other way that I have ever tried myfelf, or feen tried by others. It muft be remembered, however, that the cure of an ozæna with carious bones is always extremely tedious and difficult, owing to the foftnefs of the fpongy bones which are affected in the difeafe, as they exfoliate with confiderable difficulty; but, by perfevering in the methods juft recommended, we may always be certain of accomplifhing a cure when the fyftem is not affected by a venereal or fome other taint.

## SECTION VII.

*OF ABSCESSSES ON THE GUMS.*

ABSCESSSES occur more frequently in the gums than in other soft parts of the body, on account of their being more exposed to various accidents than other parts are. Being situated near the periosteum, they very readily originate from any thing which may injure that substance, either immediately, or from the vicinity of a carious tooth. It is indeed from this last cause that we are to derive most, if not all the gum-boils which are met with. The first appearance of a boil is by a small tumor, during a violent fit of the toothach, which tumor is commonly situated on the outside of the alveolus, opposite to the pained tooth; and, in proportion to the violence of the pain, does this tumor generally increase, until by degrees that part of the cheek which is opposite to it swells exceedingly, and becomes intensely painful, while the pain of the tooth itself is scarce at all complained of. The tumor sometimes increases to such a degree, as greatly to disfigure that side of the face on which it is; and, as soon as matter begins to be  
formed

formed in it, it generally points on the outside of the gum, at the root of the diseased tooth. If allowed to break naturally, it will, in seven cases out of ten, discharge itself by the side of the affected tooth, but, if otherwise, it bursts through the side of the gum.

In a simple abscess of the gum, the disease terminates with the evacuation of the matter, the inflammation having completely terminated in suppuration, and carried off from the tooth whatever was the cause of the pain in it. This is the abscess most frequently met with, and hence a swelling of the face is so generally reckoned a cure for a fit of the toothach. Indeed it very often happens that the cause of the toothach, whatever it may be, is dissipated, while the inflammation resolves, and the pain goes off, without any abscess at all. There are, however, many abscesses with which the gums are infested of a much more troublesome and dangerous nature. These have their seat in the sockets of the teeth themselves, and seem to originate from an affection of the nerve and blood vessel, not only at the root of the tooth, but as it passes along the jaw to it. Those who have extracted many teeth cannot but remember frequently to have met with a kind of fleshy excrescences in the bottom of each socket, immediately at the root of the tooth. These excrescences have always seemed to

to me to be the effects of inflammation; and, had the tooth been allowed to remain, suppuration would have taken place in the bottom of the socket. When suppurations of this kind, therefore, take place, they do not, as in the former cases, break out at the side of the tooth, but at the very bottom of the socket, pushing downwards along the side of the jaw, and breaking on the inside or outside, according to circumstances. In these cases, the symptoms are much more alarming and dangerous than in the simple abscess, the tumor increases to an extraordinary size, attended with most violent pain, tension, quick pulse, and all the symptoms of an high inflammation. Along with all this, there is frequently such a rigidity of the muscles of the lower jaw that the poor patient cannot open his mouth in the least. Abscesses of this kind generally burst on the outside of the face, in spite of all the care that can be taken, and the discharge of matter generally continues till the tooth is removed.

In the kind of abscess just now described, it is evident, that, as the socket is previously softened by the inflammation, and the matter formed within its cavity, the alveoli here being very thin, especially on the outside, must be easily penetrated, during the inflammatory stage of the disease,

disease, and the matter completely formed after such penetration. Thus, and thus only can we account for the constant discharge of thin fetid matter, along with small bony lamellæ, which takes place for a long time after the abscess has broke, while we find it altogether impossible to heal the sore while the tooth remains. In the other species of abscess, arising from carious, or sometimes even from loose teeth, the abscesses very commonly heal up as soon as the matter has got free vent, whereas, in the kind we speak of, the cure is always tedious and difficult.

In children, we commonly meet with these abscesses in the lower jaw, at the root of the first dens molaris, where the alveolus is very thin, though sometimes, but rarely, they take place at the root of the second, until the person has attained the age of thirty. In the upper jaw, we also, though more seldom, meet with abscesses of a similar kind; but here, as in the under jaw, it is only at the root of one or two of the molars that an abscess of such a size can be formed, so as to discharge the matter it contains at the under edge of the malar process of the jaw, first through the external alveoli, and then through the cheek itself.

In the cure of this distemper, the only thing that can be done with any appearance of success

seems to be the extraction of the tooth, and that whether the suppuration be completed or not. It has indeed been recommended to attempt the exciting of a suppuration that may point into the mouth, instead of breaking outwardly ; but, from what has already been said, with regard to the nature and seat of the disease, it is plain that there can be but little hope of doing so. The matter will always penetrate where it meets with the least resistance ; and we can scarce expect, by any application whatever, to make any place that we please the place of least resistance. Neither ought we to wait for extraction, until the tooth be carious, for it almost always, or at least very frequently, happens that the jaw bone is affected along with the tooth, so as to become carious, sometimes to a surprising extent. There are not wanting instances, where, along with a tooth of this kind, which seemed to be quite sound, or but little affected, large pieces of bone, an inch or two in length, have been extracted, entirely soft and rotten, so that it broke through all that extent, rather than the tooth would lose its hold. Thus, indeed the complaint ceased at once, but not without great detriment to the patient ; and it would certainly have been much better to have had the tooth extracted at first, even though no sign of caries appeared.

In

In some severe cases of this distemper, there is, as we have already observed, such a contraction of the muscles of the lower jaw, that the mouth cannot be opened to admit any instrument for the extraction of the tooth. Here we must instantly use every method in our power to abate the inflammation. A number of leeches ought to be applied externally, along the whole course of the swelling, and frequently repeated. As much blood as possible should also be taken away by scarifying the gums, the bowels should be kept open by gentle laxatives, and laudanum frequently given in pretty large doses. By this last, indeed, a violent fit of the toothach will frequently be checked, and of course a suppuration prevented. The reason why abscesses seldom point externally in the upper jaw, is, that, in general, the roots of both the large molares penetrate, or almost penetrate, that cavity in the cheek-bone called the antrum maxillare. If they do not penetrate this cavity, yet the lamella of the bone which separates them from it is so much thinner than either the internal or external bone, that, if matter is formed at the bottom of the socket, it will most certainly penetrate it, rather than the external alveolus and cheek. Very violent cases of this kind, however, as we have already remarked, might always be prevented, by extracting the tooth in

time. No abscesses within the socket can ever take place, without some days of previous excessive pain ; and, as neither here, nor in any other part of the body, does suppuration take place in a night, the removal of the tooth would forever prevent any such thing from taking place.

The other small abscesses which take place on the roots of the canine or incisor teeth, are seated high up upon the gum, and commonly suppurate quickly, though attended with much pain. Even these, however, are sometimes attended with such symptoms of inflammation, that it becomes necessary to take eight or ten ounces of blood from the jugular vein of the affected side, or we may open two or three of the veins below the tongue, by cutting them across. When this is to be done, we must desire the patient to put the point of his tongue against the incisors of the upper jaw, and to press out its middle, so that the surgeon may distinctly see the veins, which he can then open with great ease. To promote the suppuration, we may make use of a fig, boiled very soft in milk, and formed into a poultice ; part of this is to be laid between the cheek and jaw, and renewed every four hours. As soon as we find that matter is formed, so that we can observe it distinctly, an opening must be made through the whole length of the soft  
part



part of the tumor, renewing the use of the fig poultice, until the swelling totally subsides, which will commonly happen in a very few days.

I shall conclude my observations on this disease, with remarking once more, that all the symptoms attending the milder kind of gum boils arise from a loose or carious tooth, and therefore, when the teeth are in such a state, they ought to be instantly extracted. If any opening remains after the contents of the abscess have been discharged naturally, the only remedy must still be the extraction of the tooth; for, as the disease originally proceeded from the tooth, the same cause will always prevent the sore from healing up. I have seen many cases, where, by delaying the extraction too long, an opening in the cheek had taken place. In one patient, matter had been discharged for more than two years before he applied to me, at the under edge of the left cheek-bone. Both the dentes molares were destroyed so close to the gums, that every attempt to extract them had failed. When I saw him, there was a spot upon the cheek about the size of a sixpence, depressed below the rest of the surface, with two small sinuses in the middle, whence a little thin and fetid matter was discharged, along with some small pieces of bone at times. Such was the eagerness

eagerness of this patient to get free from his complaint, that, though he had rode sixty miles that day, I could not prevail upon him to wait till next morning, when I told him that I could easily extract the tooth, and that he would thus be perfectly cured. I therefore proceeded immediately to the operation; and, having seated him on a cushion upon the floor, I removed the gums from the rotten stump to the very alveoli; after which, by means of the key instrument, I extracted these stumps with so much ease, that, before he rose, he insisted on my extracting every carious tooth in his head, which were no fewer than nine in number. He then went to bed, and next morning the openings in the cheek were completely shut. He went to the country that day; and, in six weeks I had a letter from him, informing me, that, from the moment I had pulled the two stumps, there never had been the smallest discharge from his cheek. I have met with many other less severe cases of this kind, but all of them, excepting that just now described, were in the lower jaw, and, by pulling the tooth, a cure was always effected. In these cases, however, where the jaw itself has become carious, we cannot expect that a cure should be accomplished till the diseased part of the bone exfoliates. Sometimes, indeed, it happens that this breaks off when the tooth is pulled;

led ; but, where this is not the case, we must have recourse to such remedies as are proper for ulcers attended with caries in other parts of the body. In general, by giving free vent to the matter, and carefully separating the rotten parts of the bone, a cure will be effected where the constitution is sound ; but, in scrophulous habits, or such as are infected with the venereal disease, &c. the constitutional disease must be removed before we can hope for any success.

## SECTION VIII.

*OF ABSCESSSES IN THE ANTRUM MAXILLARÈ.*

**I**N far the greatest number of abscesses of this kind, the cause will be found to be a caries in the teeth. Sometimes, indeed, though very seldom, they arise from blows, or other external injuries ; from an inflammation in the membrane lining the antrum itself, or of that of the nose, or even of the eyes, this last being a very rare occurrence. Long continued exposure to cold has also been sometimes found to produce them, but they commonly begin with a severe fit of the toothach. After this has continued for a certain period, and its violence abated, a general forenens is felt in the cheek, above the root  
of

of the tooth which had been pained. This continues for several weeks without any external swelling ; but, at last, a slight fulness and tension is perceptible on the pained part. If proper methods are not taken, the pain continues to increase, and is frequently communicated to the eye and ear, along the mucous membrane of the nose. The antrum itself being at last filled with matter, discharges itself by the nostril of the affected side, particularly when the patient lies on that side. This is indeed almost the only passage by which matter in the antrum can discharge itself, because the membrane that covers the large duct leading from the antrum must be much more easily penetrated than the cheek-bone.

When matter is once formed within the antrum, which we may know from the symptoms above mentioned, it is impossible to cure the disease, without giving free vent to this matter. The best method of doing this is by extracting the tooth, and then, with the stilette of a common trocar, penetrating the antrum through the socket of one of the roots of the tooth just extracted. If the patient, however, refuses to allow his tooth to be extracted, the only other method is to make an opening above, and as it were between the two large teeth. But, in this last method, the opening will not be made in the

the most depending part of the cavity, so that the exit of the matter will be less free, and consequently the cure longer of being accomplished, than if the tooth had been extracted. If the disease be totally neglected, and the matter allowed to remain in the cavity, it will by degrees accumulate, so as to distend the bones of the cheek, and render them carious, as might naturally be expected. When a tooth is to be drawn, in order to cure this distemper, we may take either of the two great molares; but, if one of them be carious, it is undoubtedly to be made choice of. When neither of them is affected with any caries, it will be proper to take the second molaris, which lies next to the dens sapientiæ, rather than the first, because the plate of bone which separates its roots from the antrum is thinner than the other.

When the operation is to be performed, the patient must be seated upon a cushion on the ground, before a clear light, with his head turned back, so as to rest upon the pubes of the surgeon, and his face considerably upward, in which position the tooth is to be extracted. After it is drawn, the whole of the matter is sometimes discharged through the sockets of the roots, broken in the extraction, or corroded by the confined matter; and, when this is the case, nothing more is necessary than to see that the  
opening

opening be of magnitude sufficient to allow the whole to get out easily, and to keep it in this state, until the parts recover their tone ; taking care, at the same time, that the air have no access to the cavity of the antrum ; and this may be done, either by a peg of wood, or piece of bougie, fitted to the hole in the socket. If no matter follows on the extraction of the tooth, the surgeon must perforate the antrum itself, the patient still continuing in his former position. The perforation may be made, either with a round filette, or such an instrument as is represented Pl. 7. Fig. 1. and he will easily know when the cavity is penetrated, because no more resistance will then be felt. The instrument must then be immediately withdrawn, and the matter allowed to flow out freely. The whole of the cavity is to be washed, by means of a syringe, with warm milk and water ; after which, a small peg ought to be put into the opening, to prevent the air, or any particles of food, from getting into the antrum. The peg is to be removed three times a-day, at least, and the cavity washed, either with warm milk, or warm milk and water ; and, by continuing this treatment, the flux of matter will generally begin to diminish, and continue gradually to do so, till it stops altogether. The peg is then to be finally removed

moved, and the opening in that socket filled with a little fine scraped lint, which is to be continued till the gum heal.

Sometimes it happens, that, from a concurrence of unfavourable circumstances, the discharge of matter still continues undiminished for a considerable time after the operation has been performed. We must, in such a case, have recourse to astringent injections. Two tea spoonfuls of tincture of kino, mixed with a little warm water, may be thrown up three times a-day, or we may make use of lime-water, or a weak solution of alum. Decoctions of Peruvian bark, though commonly made use of, are improper, because they are apt to deposit a quantity of solid matter in the antrum itself, which cannot but produce much mischief. If any of the bones of the antrum should prove carious, of which we may always satisfy ourselves by using the probe, no cure can be expected until they exfoliate. In this, as well as in other cases of carious bone, the matter is thin, dark coloured, and fetid, while the caries remains, but becomes thicker and whiter as the bone exfoliates.

Hitherto we have supposed only a collection of pus in the antrum, and on that account, only recommended its perforation. But there are instances of collections of blood being formed here, in consequence of violent blows or other

injuries; and we have undoubted testimonies, that living worms are sometimes met with in this cavity. In what manner these creatures are generated in a cavity, apparently so inaccessible to every terrestrial insect, is impossible to say; but certain it is, that there they have been found, and have proved very troublesome guests. We are led to suspect the existence of worms here, when the patient complains of acute pain in this part without any fit of the toothach, or affection of the teeth whatever, and without any external inflammation or swelling of the cheek. The cure is to perforate the antrum; but, as here the teeth are not affected, there is no necessity for drawing any of them. It will be sufficient to make an opening immediately above the roots of the large molares. Such worms as appear about the opening may then be extracted by a small hook; the rest destroyed by injecting into the cavity a quantity of fine oil warm, in which a few grains of sal martis have been dissolved, by being first well ground with a small portion of the oil, for otherwise the salt cannot be dissolved. Instead of the oil, we may use solution of alum, which will also destroy these hateful insects; and, when dead, they will come away through the opening. Blood when collected in clots in the antrum may be removed by a similar opening.

SECT.



## SECTION IX.

*OF THE SWELLING OF THE CHEEK BONES, AND  
THEIR CONVERSION INTO A CARTILAGINOUS,  
OR GELATINOUS SUBSTANCE.*

THIS is one of those deplorable maladies, for which neither medicine nor surgery seems to afford any certain cure. It has sometimes been mistaken for an abscess in the antrum; and thus practitioners have been induced to make perforations into the tumor, by which the patient has been put to the most grievous distress, and all the symptoms greatly aggravated. The distemper begins like the abscess, with a swelling in the cheek, but is in reality seated in the bones themselves. It gradually arrives at a considerable size, but is equally diffused all over the cheek, without pointing as if about to break in any particular part. As the disease goes on, it acquires a great degree of elasticity, owing to the bones having degenerated into a cartilaginous, or even a gelatinous substance. In the beginning of the disease, and even for a very considerable time after, the colour of the skin is not altered, but at last suppurations take place in the soft parts. No advantage is in this case derived

derived from perforating the antrum, for there is no matter collected in it ; neither indeed has any efficacious mode of treating this disease yet been discovered. Sometimes, indeed, the removal of carious teeth has given temporary relief, and the use of mercury, and other powerful alteratives, have seemed to be of service ; but the disease has constantly returned with as much violence as before, and usually terminated in the death of the patient. This softening of the bones, indeed, whether the whole, or only a part of them, be affected, seems in all cases to be incurable.

## SECTION X.

### *OF EXCRESCENCES ON THE GUMS.*

THE gums are liable to small tumors, sometimes of an harder, and sometimes of a softer consistence. The former are sometimes almost as callous as warts, the latter like soft fungus, and have a broad basis. Both these kinds of tumors are free from pain at first, and sometimes continue for many years without giving much trouble. By degrees, however, they enlarge in size, so that the speech is impeded, and mastication rendered very troublesome, and sometimes they

they are also attended with pain. The warty like excrescences are attached to the gum by a small neck ; and both kinds are most commonly met with on the inside of the under jaw, rather than on the upper one. They very often originate from carious teeth, or from a carious state of the alveoli ; and, when this is the case, the teeth ought instantly to be extracted. If the jaw is sound, a cure will be by that means affected ; but, if the jaw itself is carious, every method must be used to promote the exfoliation ; and, as soon as the piece of bone is loose, it must be extracted by a pair of forceps. When this takes place, the tumor ought to be washed thrice a-day with a strong solution of alum, in a decoction of oak bark, or a solution of two drachms of the common styptic powder in two ounces of water ; and, by the use of these remedies, the swelling will, in favourable circumstances, go off entirely. This, however, is by no means to be expected at all times. It more commonly happens that the tumor, instead of diminishing, increases in size ; and, if allowed to proceed, soon penetrates to such a depth, as to soften the bones, while the size of it greatly distorts and disfigures the under part of the face ; severe shooting pains now begin to be felt, and the tumor quickly terminates in a cancer of such a malignant nature, as to hurry the patient to his grave much

much sooner than in any other case that has fallen under my observation. As soon, therefore, as we find the tumor beginning to enlarge in size, after the extraction of the teeth, and exfoliation of the jaw bone, we ought not to lose a moment in the extirpation of it entirely, by the knife or ligature. The latter answers very well for such as are attached only by a narrow neck, but for those which have a broad basis and feel callous, we must have recourse to the scalpel.

When an excrescence is to be removed from the gums, the patient is to be seated in a chair, opposite to a clear light, with his head supported behind by an assistant, the mouth being kept open by a piece of cork put between the teeth, on the side opposite to that where the tumor is. The surgeon may then easily remove the excrescence, by means of a common scalpel and dissecting hook; but great care must be taken to remove the whole of the diseased parts, as well as to avoid any exposure of the periosteum or of the alveoli to the air. If necessity should require it, however, we must remove every part in the smallest degree infected, even though we should penetrate to the very bone. After the operation is finished, it will be proper to allow the wound to bleed freely; for, as there are no vessels of any consequence in this part of the body, we need be in no fear of any dangerous hæmorrhage,

hæmorrhage, unless in cases of great relaxation, where the vessels are preternaturally enlarged, or where the blood itself is in a dissolved state. Where the bleeding seems to be too profuse, therefore, it will always be sufficient to touch the part with a pencil, dipped in any strong acid, or strong solution of alum. No dressing can be applied, but it will frequently be necessary to wash the part with solution of alum, or any other mild astringent. Warm milk, or any warm decoction, not of a relaxing nature, are also very useful for washing the mouth occasionally, and the cure will be promoted by lime water, port wine, tincture of roses, &c. frequently applied to the part.

In several patients that I have met with, the swellings originated on the outside of the gum, passing by degrees through between the teeth, on each side of the carious one, until it got at the inside of the jaw. Thus, the carious tooth was inclosed, as it were, betwixt two pieces of red flesh; and, as soon as it was extracted, the malady quickly spread, until it affected all the rest, from the angle of the lower jaw to the first dentes molares. These cases proved incurable; for, though the excrescence was two or three times removed, it always returned with fresh malignity, until at last it became cancerous, and the patients died. All the patients thus  
affected

affected were upwards of fifty years of age, excepting one woman, whose complaint began in her 43d year.

## SECTION XI.

### *OF THE RANULA.*

THIS is a tumor seated below the tongue, of various sizes and degrees of consistence, seated on either side of the frænum. Children, as well as adults, are sometimes affected with tumors of this kind; in the former, they impede the action of sucking, in the latter, of mastication, and even speech. The contents of them are various; in some, they mostly resemble the saliva, in others the glairy matter found in the cells of swelled joints. Sometimes, it is said that a fatty matter has been found in them; but, from the nature and structure of the parts, we are sure that this can seldom happen; and, in by far the greatest numbers of cases, we find that the contents resemble the saliva itself. This indeed might naturally be expected, for the cause of these tumors is universally to be looked for in an obstruction of the salivary ducts. Obstructions here may arise from a cold, inflammation, violent fits of the toothach, attended with swelling

ling in the inside of the mouth; and, in not a few cases, we find the ducts obstructed by a stony manner, seemingly separated from the saliva, as the calculous matter is from the urine; but, where inflammation has been the cause, we always find matter mixed with the other contents of the tumor. As these tumors are not usually attended with much pain, they are sometimes neglected, till they burst of themselves, which they commonly do when arrived at the bulk of a large nut. As they were produced originally from an obstruction in the salivary duct, and this obstruction cannot be removed by the bursting of the tumor, it thence happens that they leave an ulcer extremely difficult to heal, nay, which cannot be healed at all till the cause is removed. The best mode of treatment, however, is to lay open the tumor at once, from one end to the other. A scalpel has commonly been used for this purpose; but I cannot help thinking that the abscess lancet is preferable. From repeated experience, I am convinced, that, with this instrument, the opening may be made, from one end of the tumor to the other, with more ease, both to the patient and surgeon, than by any other. As soon as the opening is made, we will be able to discover any calcareous concretions, by which the salivary canal might have been obstructed. By keeping open the mouth

with a cork, as in other cases where operations are to be performed in the inside of it, we will easily obtain a distinct view of the tumor, and no difficulty whatever can attend the laying it open. It is of consequence to inspect the wound narrowly, in order to remove every particle of sand; for, until this be done, we cannot expect the wound to heal. The inside of the tumor must then be washed with some milk, injected by a syringe, which may frequently be repeated during the cure. Milk and water, or other diluent liquids, are here preferable to astringents, for they wash away the sandy or calcareous particles more easily than can be done by astringents, such as tincture of bark, which have been recommended, though these also will be found useful when the cure proves any way tedious.

If, instead of the usual contents of tumors of this kind, they should prove of a fatty nature, an incision ought to be made, from one end to the other, just through the skin, that we may at once see to what degree of consistence it has arrived; and, if fatty, it must be a tumor of the encysted kind. It is then to be laid hold of by a small hook, and dissected, or, as it were, scratched away from the surrounding cellular substance. By this cautious method of proceeding, we will avoid all danger of hæmorrhage; for we know there are but few large blood vessels which enter  
the



the substance of tumors of this kind in any part of the body. The only danger is from those in the adjacent parts; and there can be little danger of wounding those, if we use the precaution just now given; but, if unfortunately any hæmorrhage should happen, we may always restrain it, by applying to the mouths of the bleeding vessels a little of the common styptic powder, and pressing it to them, with some lint put between the fingers and powder. The pressure must be kept up for a few minutes till the bleeding stops; or an astringent liquor, composed by dissolving half an ounce of alum in six ounces of rose-water, may be used with great expectation of success. If alcohol is made use of, it ought only to be applied by means of lint, or a bit of fine sponge, to the bleeding vessels; and in the same way ought we to use any strong acid, if that should be the remedy applied. By thus renewing the application every two or three minutes for some time, I have seen two or three instances of hæmorrhages being stopped, in patients of a scrophulous habit, where the palate had also been completely destroyed by the venereal disease. After the operation, the patient must be kept very quiet, and not attempt to speak, or move his tongue for several hours. As no dressings can be applied, the only thing  
necessary

necessary is to wash the part frequently with milk and water, by means of a syringe.

Sometimes we meet with stony concretions in the salivary ducts, even where no tumor is present. The duct is commonly, not completely, obstructed by these, but room left for it to pass by the side of them. By the continual accumulation of calcareous matter, however, a pain takes place all along the duct and under the tongue. The complaint is easily discovered, by feeling along the duct with the point of the finger; and it may always be certainly cured, by cutting open the duct, and turning out the concreted matter which obstructed it. If it does not fall out of itself, it may be pulled out with a small dissecting hook. The wound soon heals up without the use of any application whatever. Should the duct be filled with sand or small concretions, a little scoop, such as oculists make use of for extracting broken pieces of the crystalline lens, may here also be used with success.

SECT.

## SECTION XII.

*OF ULCERS IN THE MOUTH AND TONGUE, AND  
EXTIRPATION OF PART OF THE TONGUE IT-  
SELF.*

THESE, when not symptomatic of some other disorder, are very frequently produced by broken or ragged teeth, so that the surgeon ought always to inquire carefully into the state of the teeth, when called to any patient afflicted with this disorder ; for, if the ragged points or edges, which once produced the sore, be suffered to remain, the sore will never heal. The tongue is more liable to be affected by these than any other part of the mouth. The only remedy is, either to extract the tooth, or to take off its sharp points and edges, by means of a file, taking care not to wound the cheeks, or any internal part of the mouth, with the point of the instrument. If the tooth be carious, however, the best remedy seems to be to extract it ; for, even though the points be removed from such a tooth, so that it cannot any longer wound the parts, yet the vicinity of any rotten part may occasion a difficulty in healing the sore already produced, either by the same ichor which may flow from it,

or

or by its effluvia, and this especially where the constitution is otherwise somewhat affected. The files proper for taking down the points or edges of a tooth are represented Pl. 7. Fig. 234. The only direction that can be given, concerning this operation, is, that the operator should defend the mouth from the action of the instrument with the forefinger of his left-hand, while, with the right-hand, he rasps down the ragged part of the tooth. The fore generally heals of itself in a very short time; but, if it should not, we may sometimes usefully employ lime-water, solutions of alum, decoctions of bark, &c. as lotions with which the mouth is to be washed, as directed in other cases.

Sometimes ulcers of the mouth and tongue are brought on by the too free use of mercury; but these, arising from the violent inflammation of the membrane, brought on by excessive salivations, are only small and superficial, though extremely painful. They are generally about the size of a small fish's scale, inflamed about the edges, and yellow or foul at bottom. They attack every part of the mouth and fauces, even the sides of the tongue. Sometimes the amygdalæ are affected with them; in which case it is common for unskilful practitioners to mistake them for true venereal ulcers; a most fatal mistake, which frequently occasions a broken constitution.

tion, or the death of the patient. In consequence of this error, fresh quantities of mercury are given, which not only prevent the sores already formed from healing, but produce new ones, enlarge the old ones, and sometimes cause those which had been healed up to break out again. In cases of this kind, the first step towards a cure is the giving up every kind of mercurial course; for, until this be done, no medicine will be effectual. The larger sores may be anointed with a liniment, formed by dissolving one drachm of citrine ointment in three of fine olive oil, a little of which is to be laid on with a hair pencil; the small ones that appear on the tongue or cheeks may be touched three or four times a day with a solution of corrosive sublimate, one grain to an ounce of rose-water. In a relaxed state of the parts, where the membrane is not properly ulcerated, but only *excoriated*, we may use with great advantage a gargle, composed of a weak solution of alum, with an equal quantity of fine sugar, while, at the same time, the patient should be allowed a nourishing diet, with free air and exercise, in proportion to his strength.

Ulcers produced by an excessive use of mercury, by exposure to the air, and the patient catching cold, are apt to attack the amygdalæ; and, though superficial, appear extremely ragged and unequal. In these, they spread much more than in any other part of the mouth or  
fauces,

fauces, the reason of which seems to be, that, as soon as the mercury is much felt in the breath, the amygdalæ inflame and swell, become very large and irregular on their surfaces, and small ulcers take place. If the use of mercury is still continued, and the patient allowed to go abroad, the ulceration sometimes spreads itself over the surface of both glands, from the irregular surface of which the ulcerations also appear irregular ; but, in every part of the mouth or fauces, they seldom go deeper than the membrane which lines these parts. In some old people, however, when the membrane of the cheek is either wounded or ulcerated, the sore cannot be healed, even after the cause that produced it is removed. The ulcer becomes hollow in the middle, with elevated and ragged edges, discharging a thin and fetid ichor, attended at the same time with a constant burning pain. In this manner do these ulcers frequently degenerate into cancerous sores ; so that, when nothing venereal is suspected, the only method is to remove them by the scalpel. This removal will not be attended with much trouble or hazard as long as it is superficial ; but, when deep seated, so that great part of the substance, either of the cheek or tongue, is affected, the danger is augmented in proportion ; yet, as there is no cure for a cancer discovered, the removal ought certainly to be attempted, if it can be done without occasioning the instant death of the patient.

When the cancerous ulcer happens to be situated on the side, or near the point of the tongue, so that by pushing out the tongue, the whole of the fore can be seen, it may with certainty be removed by the scalpel; but, if the ulcer be situated about the middle, or near the basis, nothing then can be of any use but removing the tongue altogether. This indeed is a very terrible operation, and which I would not advise, nor practise myself, though I have the vanity to think myself in some measure possessed of the qualities requisite for an operator. Circumstances, however, may occur, in which the miserable situation of the patient, with the intreaties of himself or friends, might induce a surgeon to attempt this very doubtful remedy, rather than suffer a human creature to perish in the extremity of misery. The division of the large arteries, and the subsequent hæmorrhage, is what we have mostly to dread here; and, unfortunately, they are so situated, that it must be very difficult to take them up in the common method by ligature. Yet, notwithstanding this difficulty, we may certainly apply the ligature to some of them, while the blood may be stopped in others, by means of sponge, agaric, or even the actual cautery; for this last terrible remedy seems more admissible here than in any other case whatever, as there is danger of strong acid

liquors, as well as potential cauteries, going down the throat, and destroying the patient.

Where the ulcer is seated on the cheek, the difficulty is less. When it is unconnected with the muscular parts, and particularly if it is situated near the angle of the mouth, or even in the middle of the cheek, we may, if proper attention is paid, readily separate the diseased parts, without doing any injury to the muscles. I have had the good fortune to remove two large cancerous sores of this kind, situated on the inside of the cheeks. The patient was seated on a chair with a low round back, opposite to a clear light, and turned a little to one side, so that the light might fall directly on the ulcer. The head being firmly supported by an assistant, and the jaws kept asunder as wide as possible, by a piece of soft cork, a circular incision was made round the upper part of the ulcer, and the anterior and inferior part of its base, all of which was carefully separated from the buccinator muscle, by a scalpel, and a pair of small dissecting forceps; after which, the back part of it being only retained by the thin membrane of the mouth, was easily separated by the scalpel. In such cases, it is plain that the sore can only be superficial; but, as no dressings can here be applied with any certainty of remaining long, I contented myself, in both cases, with applying frequently a small piece of caddice,



caddice, moistened in fine oil ; and, as I happened to be fortunate enough to remove all the diseased parts, the fores healed up again in the space of three weeks. In both the salivary duct was opened ; but, as it was in the inside of the mouth, no inconvenience was ever felt from it.

When the ulcer is firmly attached to the muscular parts, we cannot remove them in this way. We must then lay open the cheek from the angle, through the whole extent of the fore. In some instances, one half of the ulcer will be above the cut, and the other below it ; and, in these cases, both the one and the other must be removed, and a semilunar cut made in such a manner as to take in the whole of the diseased parts on both sides ; the extent of which cut will be determined by that of the fores. After having removed all these, the wound must be united by the twisted suture, as in cases of harelip. In this way, I know from experience that cancerous fores of large extent may be removed without any considerable loss of substance, which cannot be done by any other method whatever.

To remove any fore of this kind from the tongue, even that part of it which is the most favourable for the operation, is always very tedious and painful ; for which reason it is necessary that the surgeon be as expeditious as possible ; and, if any blood-vessel of considerable  
size

size is wounded, we must take it up with the needle or tenaculum, as mentioned in the chapter which treats of the ligature of arteries. For the most part, however, only a general and copious flow of blood proceeds from the small vessels of the tongue, and often no considerable vessel is wounded. Here we may more easily make use of styptics, than when the fore is feated in the back part of the tongue or fauces. Alum, vitriol, distilled vinegar, the marine acid diluted with water, may be made use of, by one or other of which the hæmorrhage may in all cases be stopped; but here, as in other ulcerations in the internal part of the mouth, there can be no dressing applied. The diet of the patient ought to be mild and nourishing, as sage boiled in milk, or rice dressed in the same way.

### SECTION XIII.

#### *DIVISION OF THE FRÆNUM LINGUÆ.*

SOMETIMES it is found, on the birth of a child, that the tongue is too closely tied down, by reason of the frænum being too short, or continued too far out towards the point of it; and, in this latter case, the child will not be able to  
use

use its tongue with sufficient ease in the action of sucking, &c. by reason of the point of it being always kept too much down. It is proper to observe, however, that, though this affection is not by any means unfrequent, it is much less common than it is supposed to be by parents and nurses. When the child is small, and the nurse's nipple large, it is common for her to suppose the child to be *tongue tied*, as it is called, when, in fact, it is only the smallness of the child's tongue that prevents it from surrounding the nipple in such a manner that it can suck easily. Mothers likewise suppose the existence of such a disease when the child is long in beginning to speak; but, at any rate, it is very easily discovered by laying the child on its back, and making it open its mouth, either by laughing or crying. In the natural state, the point of the tongue is always observed to be turned upwards to the palate, with the frænum at about a quarter of an inch distance behind the point; but, in tongue tied children, by looking upon one side, we will see the frænum extending from the back part to the very point, the whole of it being thus held down, and the point particularly turned downwards and backwards.

The only cure for this distemper is to divide the frænum, and to set the tongue at liberty;

and, for this purpose, a pair of fine scissars, with the sharp points ground off them, are equal, if not preferable, to any instrument that has been contrived. In cutting it, the child is to be laid upon its back, in the same manner as already directed for examining the mouth; the point of the tongue must be elevated by the surgeon's forefinger, and the scissars introduced in such a manner as to divide the frænum in the middle, and as far back as is necessary. Scissars of this kind likewise answer the purpose of cutting the umbilical cord under the bed-clothes.

#### SECTION XIV.

##### *DIVISION OF THE PAROTID DUCT.*

IT sometimes happens, that, either by ulcers, the operation of extirpating cancerous sores, or by accidental injuries, this duct (which is about the size of a crow quill, and conveys a great quantity of liquid into the inside of the mouth) is divided in such a manner, as to pour the whole of what it conveys over the outside of cheek, instead of the inside. The duct in its natural state passes over the masseter, and penetrates the buccinator muscle in an oblique direction,

tion, near the internal edge of the orbicularis oris. Hence, it is evident, that, if the duct be wounded in any part between its origin and insertion, unless the sides of the wound and divided ends of the duct be both immediately brought into contact, and retained in this position until they unite, the saliva must flow out through the wound externally; and, if the internal part of the wound be allowed to heal, the flux of saliva over the cheek must continue ever afterwards, unless a duct of some kind is formed artificially through the substance of the cheek to answer the purpose of the natural one.

If the surgeon happens to be called as soon as the wound is made, a cure may certainly be effected, by bringing together the sides of the wound and ends of the duct, so that, like all other divided parts, they may have an opportunity of uniting by the first intention. They may be retained in their position, either by adhesive plasters, or by the twisted suture, according to the nature and extent of the injury; but when, by neglect or want of opportunity of doing this in time, the edges of the wound have been allowed to retract, and the ends of the duct to separate from one another, that part which has nothing to distend it will soon concrete, while the other, through which the liquid constantly flows, is thus always kept open. In cases of this  
kind,

kind, we must have recourse to the artificial duct already mentioned. This has been done, either by a leaden probe, or by a cord ; but, in whatever manner the opening is made, it must be obvious, that, if all communication is cut off between the ends of the divided duct, they will not coalesce, unless brought together almost instantly after the division is made. The under part therefore will soon heal ; and, as every duct in the human body has the power of retraction, it thence follows that the ends of the parotid duct may retract so much, that, even after the leaden probe has been introduced for such a long time as to satisfy the practitioner that the artificial duct is thoroughly pervious, yet, after all, the saliva will frequently burst out again through the cheek, and render the operation entirely useless ; and, even though we repeat the operation often, the event may still be the same, as has frequently been experienced, where the patient has been thus kept in the hands of the surgeon for many weeks, nay, for many months ; though, at the same time, it must be owned that there are cases in which the operation has at once been attended with success. In forming the opening by the leaden probe, we are directed to make it of a diameter rather larger than the other ; and that, for this purpose, a sharp pointed

pointed perforator of a probe size should be entered on the other side of the fore, exactly opposite and contiguous to the under extremity of the superior extremity of the duct; and, being carried with some degree of obliquity, it must in this manner be made to penetrate the mouth. This being done, a piece of a lead probe, exactly the size of the perforator, should be introduced along the course of the newly formed opening; to be retained in it till the sides become callous, when the lead being withdrawn, the extremity of the duct should be drawn into contact with the superior part of the artificial opening, by means of a piece of adhesive plaster, and kept in this situation until a firm union has taken place. After taking out the lead, we have it in our power to expedite the cure, by rendering the end of the duct and of the artificial opening raw with the edge of a lancet or scalpel, before bringing them together. Till a firm adhesion takes place between them, the patient should be directed to live upon spoon meat, to speak little or none, and, upon the whole, to make as little exertion with his jaws as possible\*. A common seton, or cord of cotton, has been recommended for this operation, instead of lead; and a bit of catgut has been used instead of it; but nothing renders the parts so quickly callous

VOL. II.

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\* Bell's System of Surgery, Chap. xxx. Sect. xiv.

as lead ; and, besides, it is more cleanly than a cord or tent of any softer substance.

It is evident, that, in this description of the operation, there is nothing to invalidate the objections which I have made, and which are far from being founded on speculation or theory, for I know the truth of them from repeated experience. Both probe and seton are deficient in the manner already stated ; and, though the opening be at first ever so complete, yet, as in the divided state of the parts, the two ends of the duct must be at least an eighth part or more of an inch separated from one another. It is evident that the space between them requires as much to be rendered pervious, or converted into a duct, as the rest ; and, when the external edges of the wound are drawn together very close, as they must be to render the whole pervious, it is extremely probable that the upper part of the opening of the new artificial duct will be compressed, and an adhesion take place between the two sides of it. That this is really the case may also be demonstrated from the success of a method which I have tried in several cases. In one of these, the patient had been tried in the former ways for upwards of fourteen months, and by nearly as many different practitioners, until at last, by the frequent introduction of the lead probe, &c. the external appearance of the cheek had been almost destroyed,



stroyed, and the parts all round the opening were exceedingly inflamed and ulcerated. I took out the lead probe which was in it when I first saw her, and allowed the ulcerations to heal, which indeed I promoted with the utmost care, and which was soon accomplished, the patient being young and otherwise healthy, so that only a very small opening remained, very little larger indeed than the end of the duct in its natural state, through which the saliva passed over the cheek freely. I then provided myself with a large round sharp pointed needle, of the size of the duct, or a little larger, with an eye about a quarter of an inch from the point, so large, that through it I could introduce a piece of catgut, just large enough to pass easily into the upper end of the duct in the natural way. I then cut away the callous edges of the opening. Having done this, I introduced the needle as near the under edge of the superior part of the duct as possible, pushing it through the cheek in the direction of the old duct; and, having pushed the eye of the needle into the mouth, and through it introduced, for a very little space, the catgut, having previously lessened its size, so that it could with great ease follow the instrument, which was then pulled back, and the catgut along with it, after having pulled the latter through the external opening in the cheek. Having then cut off all that part of the extremity of the catgut which had been injured

injured by the friction on the eye of the needle, I formed upon this part of it a little arch, with a straight point, about the eighth or tenth part of an inch. The patient was then desired to chew a bit of cloth gently, by which means the saliva was discharged freely, and I could easily discover the mouth of the upper part of the duct, and with the greatest ease introduced the straight point of the gut into it; after which, by gently pressing on the under side of the arch, the upper end was gradually pressed a considerable way up through the duct. I then made her again gently chew the cloth, to see that the sound part of the duct was not obstructed by the introduction of the gut, but, to my great joy, found that the saliva was as freely discharged as ever. I had now introduced a full half inch of gut within the upper end of the duct, retaining more than three inches without the mouth. I now, with very strong adhesive straps, drew the edges of the wound closely together. In fifty-six hours the wound appeared whole, and in eight hours more the catgut was withdrawn; and, from the moment the operation was performed to this day, which is now six years, she has continued well.

I performed this operation in the presence of a great many witnesses. This instance is of itself

self sufficient to evince the propriety of the method I followed ; but I could produce at least three others of a similar nature. To every unprejudiced person, however, it must be evident that it is founded on the principles of reason and common sense. No fluid can pass unless it has something to make a passage for it, and unless that passage is kept free ; but, when the probe is used in the manner already described, all the space betwixt the two divided ends of the duct is left without any thing to direct the fluid through it, so that it is instantly shut up when the probe is withdrawn, and the sides of the wound pressed together ; but, in the method I have recommended, the saliva must run along the catgut, as water runs along a wet thread, until the flesh closes all round, and forms a new duct, which the flux of saliva never will allow to close up, any more than it does the natural one. I hesitate, not, therefore, to maintain, not merely that the method I recommend is the *best*, but that it is the *only* one upon which we can promise certain success, in cases where the parotid duct is divided.

## SECTION XV.

*OF THE HARE-LIP.*

THIS is a natural defect of some part of the upper or under lip, and has its name from some fancied resemblance in the diseased lip to that of an hare. Sometimes it is only a simple fissure of the upper lip from the nostril downwards, at other times the fissure is double, leaving only that part which is connected with the septum narium connected with the jaw; so that here there are two fissures corresponding to each nostril. When the fissure is single, the nostril on that side is more flat than usual; but, when double, both are in the same situation. In the latter case, the jaw is frequently in the same state, while the fissure does not proceed backward, along the process of the upper jaw, called the palate process. In other cases, however, even where the fissure is simple, not only the jaw, but all the upper part of the mouth to the throat is divided; so that the nostril of that side makes but one cavity with the mouth; and, in other cases, only that part of the os palati that forms the back part of the nostril is open.

From

From the account just now given of the varieties that occur in the hare-lip, it must be evident, that, even in the slightest and mildest degree of it, the patient must suffer a very great deformity, unless some means be instantly taken to remove it. It is not, however, merely the deformity, in this case, that calls for a remedy. When the fissure is double, it prevents the child from sucking ; and, if even a single fissure is allowed to remain till the child arrives at the years of maturity, a considerable impediment will be felt in the speech. The larger and more extensive the fissure is, the greater inconvenience must the patient suffer ; and, if the fissure extend to the throat, not only the speech, but mastication and deglutition also will be much impeded. The only cure is to take some means for reuniting the separate parts, either by future or otherwise. If the fissure is single, so must the union be ; and double if the fissure be double. But the art of surgery can go no farther than this ; for, if any part of the bone is wanting, the defect in it must be incurable.

Much has been said about the time of performing the operation. Some have insisted that it ought to be delayed for several years, while others maintain that it should be performed as early as possible. For my part, though I am against delaying it very long, I am clearly of  
opinion

opinion that it ought never to be performed before the child is weaned. To this it is objected, that, when the child is, by reason of the fissure, prevented from sucking, if the operation be not then instantly performed, it must be fed by the spoon. But we must consider, that, though the fissure should be united as soon as could be desired or imagined, the child could not suck for some time, unless it could be done without any pain, and the parts be firmly consolidated as soon as the artificial union takes place. Nothing of this kind, however, can be expected; the child would not be able to make the attempt to suck for some time without much pain; its crying would burst open the parts, and thus matters would be rendered worse than before. If again the child be fed with the spoon until the wound be thoroughly healed, it will not return to the breast, having now forgot how to suck. Besides, during the first four or six months, children are frequently distressed with spasms in their bowels, which make them cry violently; the smallness of the parts themselves, as well as their softness, must cause them make little resistance to the pins which hold the suture together, if pins are used for the purpose. Hence, when the operation is performed at a very early period, the wound is perpetually in danger of being burst open; whereas, the case must

must be greatly altered, if a delay takes place till the parts have received some considerable accession of bulk, as well as strength and firmness of cohesion. For all these reasons, I am of opinion that the operation for hare-lip ought never to be performed until the child is eighteen months old, by which time the spasms above mentioned are commonly over, while the infant can, at such an age, be secured as easily, nay more so, than when considerably younger.

The only method of curing a hare-lip, is by cutting off, from each side of the fissure, such a portion of the substance of the lip as will reduce both sides to the state of fresh wounds; the sides are then to be brought together by means of the twisted future, as directed in the chapter on futures. Some, indeed, have contended that no future here is necessary, but that the sides of the wound may be united sufficiently by means of adhesive plasters. The arguments used to prove, that these straps ought to be preferred to future, in cases of hare-lip, are,

1. The great irritation which futures are apt to produce, which, it is alleged, in some measure counteracts the intention with which they are made.
2. The contraction of the muscles, which being augmented by the pain of the futures, tends to tear asunder the wound.
3. All that can be accomplished by means of futures, may

also be accomplished without them ; for a bandage, by keeping the parts in contact, will enable them to unite as well as if they had been drawn together by the closest suture. But, whatever arguments may be used on this subject, it is impossible for a moment to suppose that any adhesive plaster, which unites only the surface of a wound, can be as effectual in promoting its consolidation, as a suture which unites it through the whole substance. Could adhesive plasters indeed be applied on the inside, as well as the outside of the lip, the case might be altered ; though, even then, the cavity in the middle would be apt to fill with matter, from the pressure being less in that part than on the external lips of the wound. Neither is it possible that any person who has once seen the mode of performing this operation, by means of the gold pins, can ever hesitate a moment about the impropriety of attempting a cure by adhesive plasters, or by bandages.

Sometimes the patient is suffered to grow up to the years of maturity before any operation for an hare-lip is undertaken, until at last, to be relieved of the deformity, or other inconveniencies attending it, he applies to a surgeon. The patient must, in performing this operation, be seated on a chair, opposite to a clear light, with his face turned a little upwards, and his head supported



supported by an assistant. The operator must carefully inspect the mouth and gums, as sometimes one of the fore-teeth projects in such a manner, as would stretch and irritate the parts after they are consolidated; or sometimes, if the fissure be continued through the palate, a small portion of the jaw-bone will project, so as to threaten a consequence of the same kind. In such cases, the tooth or projecting bone must be removed, which can be done by the small cutting forceps, represented Pl. 7. Fig. 5. The upper lip is then to be freely divided from the gums; after which, the operator takes hold of one of the lips between his finger and thumb, and, with a pair of fine edged scissors, having a strong joint, he cuts off, beginning from below, upwards, all the thin part of that edge. The assistant then lays hold of the other edge of the lip, and the operator in like manner cuts it away, making both incisions terminate as it were in one point at the top. It is necessary that both edges be straight, and all the thin part of each cut away entirely. If the operation has been properly performed, the sides will exactly correspond with each other, and the pins can then be introduced as already directed in the chapter on futures. If, however, a child is to be operated upon, it must be laid upon a table on a large pillow or matrafs, with a strong towel laid  
across

across its body, from the shoulders to the knees, and firmly pinned, or sewed down, by which the infant will be firmly secured, and at the same time with all due tendernefs; after which, the operator is to proceed as already directed. During the time he puts in the pins, the assistant must gently bring together the sides of the wound; and, as the under pin is the first that is introduced, so it is plain that it must also be the first to which the ligature is applied. After the operation, the wound is to be covered as directed, and the child allowed no food but what can be given him with a spoon.

In the double hare-lip, a double operation is, as we have said, necessary; but, if both operations are performed at once, there is some danger of tearing out all the solid parts between the fissures, or such pain and inflammation may be occasioned, that there will be a necessity for taking out all the pins together, and then doing the operation twice over in succession. In cases of this kind, therefore, we ought to allow the future of one fissure to be fully healed before we begin with another. Some practitioners have perplexed this simple operation with a number of frivolous directions, and insisted on the use of a particular kind of forceps for taking hold of the lip, previous to the cutting off the edges of it; but, for these, there never can be any occasion,

caſion, the finger and thumb of the aſſiſtant muſt anſwer better than any forceps whatever, as being leſs liable to bruife the parts, and holding the lip more conveniently than can be done by an inſtrument. The directions given for laying a piece of paſteboard, tin, &c. under the lip, and cutting upon it, proceeds on the ſuppoſition that the incifion is to be made with a ſcalpel; and from the ſame ſuppoſition proceed the abſurd directions about marking the part where the cut is to be made with ink, leſt the ſurgeon ſhould not be able, for that ſhort ſpace, to keep it ſtraight. But, it is evident, that, not the ſcalpel, but a pair of ſciſſars, ought to be made uſe of in this operation; for thus we can at once make the cut quite ſtraight on each ſide, and well defined at the upper point, which could not be ſo well done with a ſcalpel, while, by this inſtrument, the patient will not be put to more pain than he would have been by the ſcalpel. For this purpoſe, the ſciſſars ſhould be ſtrong, well poliſhed, and have a good joint. By the ſtraightneſs of their blades they will certainly make the cut ſtraight, without any difficulty on the part of the operator; indeed, with this inſtrument, it would coſt ſome trouble to make a crooked cut.

In performing the operation of hare-lip, it is of great conſequence to paſs the pins to ſuch a depth,

depth, that the whole substance of the lip on each side may be united with the other. If this be not done, there will be a gap internally, and the blood will flow into the mouth, and be swallowed along with the spittle. Hence, the direction commonly given, that the patient should swallow his spittle, is evidently wrong; and, in the Memoirs of the Academy of Surgery, there is an instance of a patient having died, in consequence of having complied with this rule, the hæmorrhage continuing without interruption, and he continuing to swallow the blood, until at last his bowels were quite filled with it. Instead of swallowing his spittle, therefore, the patient should be desired to spit it out, by which it will always be known when the hæmorrhage stops.

## SECTION XVI.

### *EXTIRPATION OF CANCEROUS LIPS.*

THE nature of cancer in general has been so fully treated in a former part of this work, that it would be superfluous to say any thing farther concerning it here. I take it for granted, that

the reader is fully convinced it cannot be cured but by extirpation. As soon, therefore, as either of the lips is attacked with this malady, it is the business of the surgeon to think of proceeding to the operation as soon as possible; for it has been observed that cancers on the lips or cheeks are even more malignant than those on other parts of the body. The under lip is more commonly affected by this disorder than the upper one; and the degree of danger is to be reckoned here, as in other cases of cancer, by the time the disease has continued, and the space it occupies. If the operation be performed in time, and before it has spread over much of the lip, it may not only be removed with safety, but without any perceptible cicatrix. After it has spread to any considerable extent, however, the case is very different. It may then indeed still be taken away, and the lip reunited in such a manner as to perform all its functions, but not without being very much contracted over the teeth. Even though the lip be wholly affected from each angle of the mouth to the top of the hollow above the chin, we may effect a cure by cutting away the whole lip, provided the parts situated on the chin alongst the jaw, and the glands below the jaw, are in an healthy state. But, in this last case, it is obvious that no union of parts can take place, by reason of the great  
loss

loss of substance; all that can be done therefore is to secure the arteries, and to dress the fore like any other. A very great inconvenience, however, will remain to the patient during life, for he will neither be able to retain his saliva, nor even swallow any liquid, but with great difficulty. This inconvenience will require a remarkable attention to cleanliness during the time the cure is going on; and it will be necessary to dress the fore once every day, or every two days at farthest. It must be observed, however, that the substance of the lips is of a much more extensible nature than any other part of the body, so that, though a very considerable portion is taken away, the divided parts will still unite, and the gap be filled up. But, when the *whole* lip is taken away, it must be evident that the wound cannot be reunited; and, to the inconveniencies attending this case already mentioned, we must add that of the gums and teeth of the fore part of the lower jaw remaining continually uncovered. This last inconvenience may in some degree be mitigated, by causing the patient wear a bandage; but those defects, of not retaining the saliva, and swallowing liquids with difficulty, cannot be abated by any means.

These are the only cases in which we are warranted to perform the operation for a cancer  
of

of the mouth. When the parts situated upon the chin are affected, or those along the jaw, the operation must then be highly prejudicial, and what no surgeon of humanity, or who has a regard to his character, ought to attempt, though I am sorry to say that I have seen it performed, even under these circumstances. One case was very remarkable. At first, it was one of those which might be operated upon with safety; the operation was therefore performed, and the wound healed kindly; but, in a few months after, the cicatrix swelled, grew hard and painful through its whole length, and this continued to increase, it at last opened. The operation was then performed a second time; but, as the whole of the diseased parts could not be taken away, the wound never healed; and, in the course of less than four months, all the parts upon, and around the chin, and upon the lower jaw, were much swelled and indurated, and had assumed a dark purple colour, with matter bursting out from innumerable small pores, attended with great pain. The disease continued to extend itself with great rapidity, until the patient perished in a miserable manner, and in all probability much sooner than he would otherwise have done. I have met with several instances of a similar nature, and believe that we may generally lay it down as a rule, that, where the

operation has been once performed, and the disease very speedily returns, though the operator be certain that he has taken away all the diseased parts, a second operation, instead of affording any relief to the patient, will only serve to destroy him the sooner.

In performing this operation, the patient is to be seated on a chair, as directed for the operation of hare-lip; but, as there is in this case no division of the parts naturally, the scalpel is here much preferable to the scissars. Something may also be requisite in this case to stretch the lip, and direct the knife. For this purpose, a pair of forceps, though superfluous in the hare-lip, are yet very useful here. Those represented Pl. 7. Fig. 6. answer the purpose perfectly. These must be fitted to the right-side, and held by the operator with one hand, whilst he cuts with the other; after which they are to be fitted to the other side, and he is to proceed as before, only causing an assistant hold the forceps, that he may conveniently employ his right-hand in cutting. The cut being made along the side of this instrument, will always be very straight and exact, which it is proper that it should be. As soon as the diseased part is entirely removed, the sides of the wound are to be brought nearly together, and the pins introduced and secured with a waxed thread, beginning at the upper part, and



and managed in all respects as directed in hare-lip.

## SECTION XVII.

## OF DENTITION.

THIS is the first and most universal disease of the mouth to which the human species are liable ; and, though a natural process, is as strictly and properly a *disease*, or attended with a disease, as any other, seeing we often find that infants die of it. The disease consists in the injury done to the gums, by the teeth breaking through and tearing their fibres. Most people are furnished only with two sets of teeth, though there have been a few instances of a third set appearing in extreme old age. The first set are commonly twenty or twenty-four in number, the second thirty-two. In general, the first set are formed in the jaw before birth, but do not appear beyond the gums; though to this also there are exceptions; and children have been known to be born with teeth in their mouth. They commonly begin to appear about the eighth or ninth month, though sometimes much sooner, and the  
first

first are generally two of the incisors of the lower jaw. They are followed by two of the same kind in the upper jaw, then by the same two teeth on each side, between the incisors and the dentes molares or grinders; and, last of all, these grinders make their appearance. But, however uncertain the time may be that these teeth make their appearance, the symptoms arising from the irritation they cause on the periosteum and gums are generally similar and unvariable. The gum becomes painful, inflamed, and a little swelled; the child constantly rubs it with his finger, and there is a copious flow of saliva; the child is also very restless, cries much, cannot sleep much; and when he does sleep, it is frequently interrupted by startings; the latter not unfrequently taking place, even while the child is awake, and sometimes even increasing to actual convulsion; the pulse is quick, the skin hot, and the belly generally very loose, though sometimes costive, as indeed there are instances where the mouth is dry, though more frequently there is a great flow of saliva. These symptoms are probably owing to the pain and irritation of the sharp edges of the teeth upon the gum, but seldom make their appearance till the sixth or seventh month. Sometimes they may be relieved by opiates, or other medicines, capable of allaying a general irritation

tion of the system ; but, when these fail, we must have recourse to a surgical operation, and remove the disorder, by making an incision directly through the gum upon the tooth. This is called scarifying the gums, and is especially of use where the child is convulsed ; but there is a general prejudice against it, on account of its supposed production of an hard cicatrix, which, if the tooth is not just ready to penetrate at the time, will hinder the penetration afterwards. Practitioners giving way to this prejudice, have fallen into an error, by delaying the operation until the gum be so considerably swelled, that there is reason to think the tooth is just ready to break through ; but, by that time, the worst symptoms are past, and there is much less occasion for the operation than there was formerly. At any time, therefore, when the symptoms are very urgent, and we are sure that they proceed from the irritation of a tooth, we ought immediately to proceed to the division of the gum, in that part where there is most reason to expect the appearance of a tooth. Neither will there be any danger of repeating the operation, should we not succeed at the first, as there is never any danger of an hæmorrhage, only a few drops of blood flowing from the wound made by the lancet, or other instrument employed in the operation. The most proper instrument for this purpose

pose is the gum-fleam, represented Pl. 7. Fig. 7. The incision ought always to be made down to the very tooth itself, either till the latter can be seen, or at least till it is distinctly felt by the instrument; and, if the tooth which is to make its appearance be one of the incisors, a simple incision only is necessary; but, for one of the molares, a crucial incision will be required.

When the gum of a child is to be scarified, it must be laid upon the nurse's knee, with its face to a clear light, the nurse securing its arms with her right-hand, whilst its head leans upon her left-arm. If the tooth is in the lower jaw, the surgeon must stand before the child, and, with the forefinger of his left-hand, press down the under lip so strongly that the mouth may be opened. The edge of the instrument is then to be set upon the gum, at the part where the tooth is expected, moving it firmly and steadily along the whole extent of it, making the incision deep enough to feel the tooth with the edge of the instrument, as has been already mentioned. If the operation be successfully performed, the violent symptoms with which the child was affected will go off almost instantaneously, especially the nervous and convulsive ones. Sometimes, however, the diarrhoea will continue very severe, attended with copious stools of a green colour, intermixed with small bits of a caseous matter,

matter. These symptoms may very effectually be relieved by a few grains of salt of tartar, along with a drop of laudanum to each dose. From this I have found much more beneficial effects than from all the different earths conjoined with opiates that ever I tried, and certainly must be extremely useful in all diseases of the primæ viæ in children, where acidity prevails.

The symptoms of dentition are most violent in children. The first set of teeth drop out between the fifth and twelfth year, and are succeeded by those called *permanent*, though these also decay very quickly in some cases. As the gums, however, are now perforated, and a ready passage formed for the tooth, these seldom give any pain; but, as the number is now increased, and the gums must be perforated in other places where no tooth existed before, it is not unfrequent for symptoms of dentition, sometimes very severe, to take place before all the second set of teeth make their appearance. The *dens sapientiæ*, as it is called, being the last that appears, is frequently attended with much pain, though in general, as the system is at that time of life much less irritable than in childhood, none of those nervous symptoms to which children are liable are now to be met with. The patient, instead of these, has violent pain and inflammation,

tion, not only over the place where the tooth is to make its appearance, but over the whole jaw; and this is said sometimes to arise from want of room for the teeth in the jaw; for which reason, some have not only directed the tooth to be pulled, but even asserted that they have seen great relief from the doing so; but, whatever may be the assertions of the most eminent of the profession in this respect, we may be assured that they are *at least* mistaken in their assertions. It is impossible to pull the dens sapientiæ while only in the act of protruding beyond its socket in the jaw, and when it requires a deep incision to feel it with the edge of the fleam. I have indeed seen the tooth next to it, even in that early period of life, carious, and at the same time exquisitely painful, the whole gum and throat being thus inflamed and swelled; but every one of these symptoms was effectually relieved by extracting it, and making an incision in the gums upon the dens sapientiæ, as already directed in the case of children.

SECT.

## SECTION XVIII.

*DERANGEMENT OF THE TEETH.*

THIS more frequently takes place in the second than the first set of teeth, and is most commonly met with in the incisors or canine teeth, the molares being seldom or never affected with any irregularity of this kind. It may arise from the following causes. 1. When some of the first set remain firm till the second make their appearance, either on the inside of the mouth, pointing obliquely inward, or on the outside of the gum, pressing in a direction nearly similar to the first. 2. The small size of the opening made by a tooth of the first set, which does not allow the second larger one to pass freely, but affording less resistance in one part than another, causes it to fall out of its line. 3. After all the incisors and dentes canini with the two small molares have dropped, and made their appearance successively, the teeth, in general, bear no proportion, either to the size of the jaw, or of the person himself, by which means one tooth generally overlaps another; for, as the four incisors are first shed, they may, after the canine

tooth has also dropped, occupy the whole space, in such a manner as to cause it appear on the outside of the gum, overlapping both the first molares and second incisor. Thus, I have seen all the four canine teeth out of their places, though commonly the upper ones are thus deranged.

In the first case, where the disordered appearance of the teeth is owing to some of the former set remaining firm, while the second are coming out, the best, indeed the only remedy, is to pull the tooth or teeth which stand in the way ; and, after the second tooth increases in size, it may be gently squeezed inwards with the point of the finger for half an hour ; or, if it points inward, it may be pressed outward for the same time three or four times a-day.

In the second case, *viz.* where the tooth is too large for the space allotted for it, it is evident, that neither tying, pressing, nor any other mechanical means, can bring it into a line with the rest. The only method is to extract the others which stand in the way, particularly if it be one of the incisors, which are commonly larger than the rest, and being most conspicuous, any deformity in their arrangement is more disagreeable than in the other. The only remedy, therefore, must be to pull the tooth adjacent, that the new  
one



one may have room enough to grow up in its place.

In the third case, the only remedy is to pull the small incisor; after which, in almost every case, the canine tooth will fall into its proper place, and fill up the gap entirely. It is not uncommon indeed for nature to supply this deficiency. I have been witness to many cases where the canine tooth pressed upon the small incisor to such a degree, as to force it entirely out of the socket, and occupy the place of it.

Instead of the methods just now recommended, it is usual for practitioners to employ ligatures, metalline plates, &c. to force the deranged tooth into its proper place; but common sense may inform every one that it is absolutely vain to attempt by violence to bring a tooth into its place, without first making room for it; and, when this is done, a slight pressure will be sufficient; indeed, frequently the tooth will fall into its place without any pressure at all. If by any accident the teeth are thoroughly loosened, or driven out of their places, they ought instantly to be put back again into their sockets; and, if the parts are quite sound and fresh, they will soon become as fast as ever. If broken, the deficiency may be supplied with artificial teeth, or by transplanting fresh teeth. Some have advised to use a ligature for drawing together two distant

distant teeth ; but this at best can be only supplying one deformity by another, not to mention the great danger there is of loosening them in their sockets, so that they will soon drop out altogether, or be perpetually troublesome.

## SECTION XIX.

### OF LOOSE TEETH.

THOUGH, from the appearance of a fine set of teeth in a young person, we would be apt to imagine that they must certainly continue as long as the human frame subsists, yet they very frequently become loose and decay, not only before the rest of the body, but before it has arrived at maturity. It is very remarkable that this decay is common to all the bones in the body, but begins much sooner in the teeth, which are harder than any other bones. Whether this proceeds from the vessels of the teeth being so fine, that they become much sooner obstructed than in any other, or whether they are to be considered as a kind of concretions, at least some part of them, without any vessels at all, cannot perhaps be determined ; certain it is, however,

however, that they are very often the causes of great distress, and are liable to decay and become loose from many and various causes, as,

1. By blows, falls from horses, or otherwise, by which they are sometimes not only loosened, but moved out of the sockets.
2. By an improper use of the instrument for pulling teeth, which, by pressing upon some in the act of extracting others, may loosen the former ; and, in this manner, I have seen several of the incisors loosened, during the extraction of the molares.
3. They are often forced out of their sockets by a tartarous substance, of which we shall speak in the next section, collecting upon them in great quantity. This, by accumulating very much near the roots of the teeth, and forcing away the gums from them, at last acts as a kind of lever, by which they are raised out of their sockets altogether.
3. From diseases, either of the whole system, or of the gums and mouth themselves. The general affections of the system, by which the teeth are most commonly loosened, are the scurvy, and ptyalism by mercury. By the former, the teeth are affected in a very peculiar manner, and will even fall out in spite of every remedy that can be applied, until the disease be removed by proper remedies. The gums ought then to be well scarified on both sides, the depth of the scarifications being proportioned

portioned to the softness of the gums ; for these do not recover their natural state for a considerable time after the general disease is cured ; and the discharge of blood ought to be promoted, by washing the mouth frequently with water made as warm as the patient can bear, which should be continued till the sponginess and softness of the gums is gone. Gentle astringents are here of much service, but the stronger will certainly do much hurt. Tincture of roses acidulated with diluted acid of vitriol, port wine with tincture of bark, or tincture of bark with six times its quantity of water ; or tincture of myrrh in the same manner may be used with great advantage. In cases of salivation, no cure can be applied till the salivation stops, when the teeth will fasten of themselves.

We have just said, that, in cases where the teeth are loosened, in consequence of the patient having taken a large quantity of mercury, they will generally fasten and become firm of themselves, as soon as the effect of the medicine is gone off. But, if the constitution is infected with a scorbutic taint, proper remedies must be exhibited to restore it to its pristine vigour. When this is done, the gums ought to be scarified, both on the outside and inside ; and this to be done to a depth proportioned to the softness of the gums, and the discharge of blood promoted

moted at each time of scarification, by causing the patient wash his mouth with water as hot as he can bear it. This ought to be repeated several times, for the sponginess will not be removed by a single scarification and washing, nor perhaps by two or three. The teeth and gums may be frequently washed with tincture of roses, gently acidulated with diluted spirit of vitriol. Two tea spoonfuls of tincture of bark, with six of water, may be used, or equal parts of port, wine, or two tea spoonfuls of tincture of myrrh diluted in six of water; but no stronger astringents can be admitted, as the use of them has been found attended with very disagreeable circumstances.

When the teeth happen to be loosened by blows, the sockets themselves are always injured. If the tooth is entirely forced out, it must be washed with milk-warm water, and returned into the socket, pressing it well down to the bottom, and fastening it to the two adjacent teeth, by a thread of silk, or any other soft substance, waxed. The socket is then to be carefully pressed round the root of the tooth; and every loose tooth must be treated in the same manner, being tied to its two neighbours. The patient, however, must not be allowed to use any freedom with his teeth, till they have attained a sufficient degree of firmness; nor is he to use any food  
but

but what he can take with a spoon. If properly managed, teeth, though ever so much loosened, may acquire a degree of firmness, which may make them last several years. But, if they again become loose, and project beyond their proper line, it will be found impracticable to reduce them to their proper situations ; for, on every attempt to replace them, the patient always complains of great pain in the socket ; and, if the tooth do not drop out of itself, small gum boils will form on the outside of the gum, which, though removed, will instantly return, until the tooth be totally removed. I have met with many cases of this kind ; and the only remedy I can recommend, is to remove the tooth ; and, as soon as the gum heals completely, to have an artificial tooth put in by a dentist.

It has been the opinion of the most celebrated dentists, and indeed of people of all denominations, who concerned themselves with the cure of human teeth, that it is of the utmost consequence to preserve the enamel over every part of the tooth. But an operator has lately appeared, who embraces an opinion directly contrary. He observes, that in animals, where the enamel is constantly worn off, and the bone of the tooth bare, he never saw a carious tooth. When he meets with a carious tooth, he cuts out the carious part, and then makes an incision along the  
crown

crown of the tooth, cutting quite through the enamel every where to the bone. In great numbers of people, this gentleman has cut the enamel, not only of the whole set of teeth, but, where one of them happened to be too long, he has cut off the superfluous part; and, if there was any general irregularity among them, he has reduced them all to a size, as regularly as any mechanic would do any mechanical piece of work under his hands. Neither have these operations of sawing, rasping, filing, &c. ever been attended with any inconvenience; on the contrary, the teeth have always remained perfectly sound.

In old people, the teeth frequently become loose, from causes very different from any we have yet mentioned. These are no other than a decay of the body itself, which it is impossible to repair. The sockets become incapable of holding the tooth, and the tooth of remaining in the sockets; and, as no method can be found of counteracting these natural defects, it is improper for a surgeon to meddle with any in such a situation.

## SECTION XX.

*OF THE CLEANING OF TEETH.*

IF no care is taken to clean the teeth from any fordes that accidentally fall upon them, they become yellow, with small black spots here and there, and are always full of masticated matter of one kind or other. This soon becomes putrid from the heat and moisture, and affects the teeth most disagreeably. This might be entirely prevented by washing the mouth after every meal with salt and water; but previously we ought carefully to scrape off every particle of masticated matter, whether animal or vegetable, with a thin piece of hard and tough wood, softened at the end by bruising it as it were into threads; this being frequently dipped in a little of the best white wine vinegar, till the roots of the teeth, as well as the parts between them, are to be carefully washed out. In this way their colour will in a few days be restored, and the fautor of the breath be corrected, from the extraneous matter being removed. No metalline instrument ought ever to be applied to the teeth; for, as in most of them, the enamel on the sides is very thin, if it happen to be scraped off, or made

too



too thin, the teeth must always appear yellow, or of the colour of the bone which is exposed to the air. But calcareous matter is frequently met with adhering to the roots of the teeth of almost every person in a greater or less proportion. Some indeed are met with who have depositions of this kind to a much greater degree than in others.

The ordinary place where depositions of this kind first make their appearance is the roots of the incisors of the lower jaw, then it attaches itself farther up upon their bodies ; but in general it runs downwards, and collects in great quantities about the roots immediately along the gums. In general it penetrates downwards, being more readily attached to the roots of the teeth than their bodies.

The reason appears obvious, from the roughness of the roots and neck of the teeth ; and from their want of enamel, it adheres to them in great quantity ; but, in some habits, the propensity to collect this matter is so great, that it has been found to cover the teeth on the inside throughout the whole mouth.

This is a very frequent complaint after long and severe salivations. In cases of this kind, I have seen all the molares, both above and below, almost completely covered with the matter to a great degree of thickness. The thickness was  
greatest

greatest about the necks of the teeth ; and the adhesion so firm that it seemed to be a part of the tooth itself. It will always be found, however, to adhere most firmly, and to acquire the greatest thickness, on those teeth which have the least enamel. The teeth continue as loose as ever ; and if from age, or any other cause, the gums happen to retract, you will then find tartar in abundance, which in general always insinuates itself downward along the root of the tooth, forcing away the gums at last almost entirely from them.

At any rate, this disorder of the teeth can never be mistaken for any thing but what it really is. It is of a yellow or brownish colour, rough to the feel even of the finger, but much more to the tongue. When of great thickness, especially after a violent salivation, many parts of the cheeks are filled with superficial ulcers, of a yellowish colour, and resembling an honey-comb in the bottom, insomuch that they have often been mistaken by practitioners for true venereal sores, but when treated as such, which has been too often done by practitioners, the health of the patient never failed to be completely ruined. For the more mercury that is thrown into the system, the more they spread, and the worse they look. Having originated at first from too free a use of the medicine along with the irritation of the tartar, it is impossible they can ever be the better from the use of more mercury, the  
removing

removing of the tartar being the only method by which they can be cured. In general, the teeth, after being once loosened by a quantity of tartar surrounding them, can never be thoroughly fixed again without instruments for removing it; for which purpose the best adopted are those represented Pl. 7. Fig. 8. 9. 10. 11. 12.

When any metallic instrument is made use of for cleansing the teeth, we must take great care not to hurt or destroy the enamel, or force away the gums from the sockets as much as might be done in this way. When the operation is to be performed on the under jaw, the patient must be seated on a cushion on the floor; whilst the surgeon seats himself behind, making the patient turn his face upwards and backwards, leaning his head on the surgeon's left groin; having covered the left thumb with a piece of wet linen cloth, or having it covered with a fine glove moistened, with this he presses firmly upon the tooth that it may not be loosened. The edge of the instrument is then to be pressed into the thickest part of the tartar, and split by it; and this to be repeated until the whole be removed. Thus, we can be in no danger of hurting the neck of the tooth, and all the tartar will soon scale off. The largest pieces will easily be removed; and, if any small bits happen to remain, they may also be taken away, by pulling the instrument repeatedly upwards, along the surface  
of

of the whole tooth, until every particle is taken away.

When the teeth of the under jaw are all cleaned, if there is any occasion for cleansing those of the upper jaw likewise, the patient must be placed on a low seat, with the head leaning upon an assistant behind. The forefinger of the left hand must now be used for fixing the teeth ; and the same method practised as directed in cleansing the teeth of the under jaw. If there is any tartar upon the inside of the lower incisors, it must be taken off while the surgeon sits before the patient, which he must always do in cases of this kind.

After the teeth are thoroughly freed from the tartar, we may make use of a brush with a piece of sponge on the opposite end. The brush may be dipped in a solution of two drachms of salt of tartar, and an ounce and a half of rose-water. With this the teeth ought to be well washed every morning and evening for several days. Thus every particle of the tartar will be completely removed. After this, the teeth should be washed morning and evening with a little common salt and water ; but the washing with the salt of tartar may be renewed, only the solution ought to be reduced to one third of the strength above prescribed. By the use of these means, the tartar being once fairly removed, its  
further

further growth will be effectually prevented, and the teeth preserved entire for a long time.

## SECTION XXI.

## OF THE TOOTHACH.

THIS is a disease so exceedingly tormenting, that the cure of it has been a desideratum since the existence of the art of surgery. Numberless quacks have imposed their pretended remedies as infallible upon the credulous and unwary; while it has often happened, that these impostors have suffered as severely as any body, without being able to give themselves the smallest relief by all their boasted panaceas. On the other hand, all the inquiries that have been made on the rational principles of the surgical art have proved equally unsuccessful, and the disease is still generally considered as absolutely incurable.

Some constitutions are much more subject to this disease than others. Many are tormented with it even from their infancy; while others never have any attack till far advanced in life. It has been said that *consumptive* people never have the toothach. But this, upon inquiry, appears

pears not strictly true. It is certain that *some* consumptive people have the toothach as well as others; but it certainly is the case, that fewer of that description have the toothach than of any other description of mankind. We have not, however, as yet been able to distinguish what peculiarity of constitution renders a person more or less subject to the attacks of the toothach. But in those whom it violently attacks, the pain is sometimes so exquisite, that the patient becomes frequently almost distracted. But we must not imagine, that in violent toothachs, the pain is absolutely confined to the tooth itself;—No,—However violent this pain may be, it is by far the least part of the complaint, even when it is extended also to the jaw, which is by no means the principal or most tormenting part of the disease. There is a violent pulsatory pain, which strikes up from the centre of the tooth all along the course of the nerve to the top of the head. By the severe shakes which this pulsatory pain gives, the whole system is so disordered, that the patient staggers like a drunk person, and sometimes even falls down insensible. This is the most violent and destructive pain which ever attends the toothach. Others there are, however, sufficiently distressing; a pain from a carious tooth frequently strikes from the tooth into the ear, and sometimes to the eye. The  
consequence

consequence of frequent attacks of violent fits of the toothach, has frequently been the destruction of the strongest constitutions; and, in other cases, where the mischief has not proceeded to such a length, fevers have taken place in young persons, of the most dangerous and fatal type.

A fit of the toothach in those subject to it is brought on by several evident causes, by all of which, however, the nerve is affected. The most obvious of these is a caries affecting the enamel. By this the air, and cold, and moisture are admitted to the body of the tooth, and of the nerve, where they produce all the symptoms usually produced by them in other parts of the body. In these they never fail to excite a most severe and dangerous inflammation; as, for instance, in the cavities of the abdomen, bladder, cranium, &c. As inflammation in these parts very frequently ends in suppuration, so does it also among the teeth, as is seen from the softness of the pulp, as well as the fetor of it, which takes place after a long continued fit of the toothach.

Matter, when in contact with a bone in any other part of the body, always softens and destroys it; and just so is it with the teeth. The caries which takes place in bones, in consequence of their being in contact with matter, always produces an acrimonious discharge; and

so it is with the teeth ; but nerves are too delicate to bear any acrid matter applied to them. Hence, by the acrimonious matter produced in the toothach, the irritability of the nerves is increased excessively ; and not only the tooth itself, but all the neighbouring parts, are affected beyond measure. Nay, the affection is not confined to the parts adjacent, for the whole system is thrown into disorder ; even the stomach being frequently remarkably affected.

These violent symptoms have been sometimes so extremely complicated, that injudicious practitioners have been apt to mistake them as arising from some other cause ; while more attentive observers have found them all to arise from carious teeth. In violent cases of this kind, it is not uncommon to find the edges of the tarsi completely excoriated both above and below ; and, if this has continued for any length of time, the whole of the cilia must be destroyed. The eyes themselves are affected with a general redness ; and the whole of the adnata affected with heat and redness ; the consequence of the whole being the loss of sight. Sometimes one eye is affected in this manner, sometimes another, and sometimes both. On examining the teeth of the upper jaw of the side affected, or even the other, you will generally find one of the large molares, or most frequently both, so completely



pletely decayed, that nothing but the basis of the corona remains, keeping the roots all together. Sometimes even this is not the case, for all the roots will be found standing separately. In these deplorable circumstances, I have known men of great eminence in their profession apply blisters down the side of the throat, and behind the ears, leeches, and all the different ointments which have been held as proper for abating inflammation, even all those applied in the different species of ophthalmia, and all this without the least success, till, upon the extraction of the carious tooth or stumps, every symptom has vanished in a few days.

A great many cases of this kind have come under my care, of very long standing, all of which were instantly cured by pulling the carious teeth; though they had baffled the skill of some men very eminent in their profession.

A fore tooth may be broken without much inconvenience, at least for some time; nay, probably, if they are not attacked with very violent fits of the toothach, no inconvenience may ever be felt; for the plates of bone are exceedingly compact, and of a strong texture. Hence the fibres are not only very strong, but, of consequence, the nerves much less irritable, or subject to inflammation.

For

For the same reason, inflammation will take place less frequently here than in any of the molares.

Cold is one cause by which fits of the tooth-ach are brought on ; but, besides this, there are many other causes by which an attack may be occasioned, such as taking hot liquids, especially of the saccharine kind ; any hard substances pressed against the nerve in time of mastication ; or the use of a picktooth immediately after a meal. Any of these will produce a fit, after the air is admitted to the heart of the tooth. The immediate cause is the destruction of the enamel ; for which there are many causes. One, by no means uncommon, is the eating of acid fruits, especially those mixed with much saccharine matter, which renders them very agreeable to the taste. Of this kind are nectarines, apples, peaches, &c. but which are found to destroy the teeth in a very short time. I have known many young people who took great pleasure in eating plain sugar when they could not get fruits. Thus they quickly lost their teeth by caries ; which no doubt was the sooner brought on by their taking every thing liquid excessively hot. Such people, in a few years, had scarce a tooth in their head which was not affected more or less, though it must be acknowledged, that this affection was not attended with any great pain.

As the toothach is a complaint so extremely common, I am tempted to think, that the persons who have such frequent and violent attacks have originally some bad conformation of the teeth themselves, such as too great a thinness of the enamel, or softness of the tooth itself. On these accounts, they are more easily affected than others by any of the abovementioned causes; and, for the same reason, any irritating cause will have more effect upon them than upon others who have not the same natural defects. Salivations frequently destroy teeth; but there are many who scarce have a whole tooth that never touched mercury. It is probable, therefore, that, the enamel being very thin, if a person takes, at one time, a great quantity of hot liquids, or food, and another of cold, that an attack of the toothach may commence. Nay, every one knows, that a practice of this kind very frequently produces great pains through all the teeth, although there be not the least morbid affection in any one of them otherwise.

It is evident that, in cases of this kind, repeated attacks from the infancy, must greatly tend, where the enamel is very thin, to produce an affection of the whole body of the tooth, which can never after be removed. In many cases, I have observed that the enamel upon one of the large molares has been rendered completely carious

rious in a very short time, even to the centre. No sooner was this the case, than the destruction spread rapidly, so that the whole surface presently shared the fate of the rest.

Thus, the molares on one side are sometimes all destroyed, while, on the other, perhaps only one or two will be affected. This seems to show, with great probability, that the persons thus affected have no general disease of the system, but that there is a morbid affection of some of the teeth, and not of others. This morbid conformation consists first in a debility, by which the vicissitudes of heat and cold affect them more strongly than others; or, perhaps, they may be affected by causes very different, and which lie beyond the reach of our investigation. Certain it is, however, that a violent and long-continued fit of the toothach seldom arises but from a carious tooth; and we know also, that the pain attending a carious tooth is at times very different in intensity even in the same person. It is worth notice, that, while a tooth is pained, the cheek above it, and parts adjacent, seem to be seized with an invincible coldness, so that, though you can easily warm all the surrounding parts, yet this fails not to remain in a manner like a stone. Nay, it very often happens, that, if we can get the better of this cold, the pain will be removed.

Many

Many teeth have become carious, and gradually consumed away entirely, with scarce any pain to the patients ; while others belonging to the very same person, probably on the opposite side, indeed, have been affected with all the most violent symptoms formerly enumerated. In some the pain has been so exquisite, that even the crash, in the moment of pulling the tooth itself, was not to be compared with it.

In the cure of this disease, daily experience shows that no fixed rule to go by can be laid down. No medicine with which we are acquainted will at all times certainly even mitigate or moderate the fit. Instances indeed there have been of people accidentally and unexpectedly finding relief after taking something ; and these sudden and unexpected reliefs have been the foundation of endless quackery. No rational practitioner, however, is to expect that any thing he can administer in the fit can possibly give immediate relief. I would never advise even the extraction of a carious tooth, though very painful, if the pain can possibly be borne. Blisters behind the ears, and large doses of laudanum or opium, are useful in cases of this kind ; the opium especially. In some patients, I have known the return of the toothach prevented for a long time by an issue in the arm, or back of the neck. I have also frequently given temporary relief, by  
touching

touching the nerve with opium, or some of the essential oils. It has sometimes been of use to destroy the nerve by means of the actual cautery. The apparatus for the purpose is a common wire bent and made red hot, which will answer the purpose as well as any instrument the cutler can possibly make, as you have it always in your power to bend it in any way you please. One objection, however, seems to lie against the use of it, *viz.* the smallness of the wire itself. For, though once fairly red hot, yet, unless of some considerable thickness, it will cool almost instantaneously, so that the nerve will not be destroyed by it. But in this, indeed, much depends on the dexterity of the operator. It must also be observed, that, in this operation, unless the nerve be totally destroyed, no benefit can accrue to the patient. The pain of this operation is by no means inferior to extracting the tooth.

From daily observation, we learn, that, in people subject to the toothach, only a single tooth is so totally diseased that it requires extraction; and, what is remarkable, after this tooth is extracted, the patient may, perhaps, throughout life, never have occasion for the extraction of another. In other cases, two or three of the teeth may be met with in a carious state at different intervals, all of which require to be  
extracted;

extracted ; and, after this is done, the patient will perhaps continue easy for life.

It frequently happens that a small hole breaks out in the centre of one of the molares. Whenever this is observed, every care must be taken to keep out the air or other extraneous bodies. Various substances have been recommended for the purpose by different practitioners, but bees-wax or gummaſtic will always be found to answer the purpose ſufficiently. Metallic ſubſtances, particularly tin, lead, and gold leaf, have been recommended by very eminent practitioners ; but no metal is very friendly to the teeth, and maſtic or bees-wax will never be found to fail ; and, after every thing has been tried, the patient will be obliged to have recourſe to them at laſt. As the tooth is now in a diſeaſed ſtate, although the deſtruction of it be not attended with much pain, yet the pulp will ſoon diſſolve. Now, if it be ſtuffed with any hard body, ſuch as tin or lead, though it be done in the moſt careful manner, yet if we will take the trouble to examine the tooth ſix or twelve months after, we ſhall find the metal quite looſe, and the hole within the body of the tooth greatly enlarged ; whiſt, at the ſame time, the opening in the enamel may perhaps remain the ſame as when we firſt filled it. In this ſituation, as we cannot remove the metal through the ſmall opening in the enamel,

in order to clean the inside of the tooth before we stuff it again, we must therefore push the whole of the tin or lead, with which the tooth was formerly filled compactly, into the large cavity of the tooth, and then add more to fill up the vacuity.

In cases of this kind, unless the opening in the tooth be more contracted at top than at bottom, or lower down, neither tin leaf, nor any substance of that kind that can be had, will stick in the hole. Before we can attempt to fill the tooth, every extraneous body must be clean taken out of it; and no attempt to fill the tooth must ever be made during a fit of toothach, or when there is the least pain in the tooth. If we do not carefully attend to this, we will often bring on such violent fits of pain, that they cannot be relieved by any thing but extracting the tooth.

The method of stuffing the tooth with tin is as follows. Having cut off a small slip of the metal, just as much as appears sufficient for the purpose, the end of it is to be introduced into the hole of the tooth, and as much more pushed in as will fill the whole cavity of the tooth, and every vacuity taken up, and the whole made smooth by a proper instrument, such as that represented Plate 7. Fig. 13.

When this operation is properly performed, the air, and every extraneous body, will be so completely



completely kept out, that the patient may perhaps remain easy for several years; although, during all that time, the destruction of the tooth must go on without intermission.

When the disease makes a very violent attack, and neither blistering, anodynes, nor any other remedy is of any use, the only method is to destroy the nerve altogether; and this is most effectually done by extracting the tooth itself. When an operation of this kind is to be performed, we must consider of the most proper method of doing it, with the least pain to the patient. Here, from the nature of the alveoli, it is evident that all the teeth in the jaw may be pulled with almost equal ease either to the one side or the other, excepting the farthest back. The extraction may be made by fixing the claw of the instrument either on the outside or inside of the tooth; thus turning it either into the mouth, or towards the cheek. From the formation of the jaw at its angles, however, it is invariably the practice to pull the last tooth inwards, where there is occasion to draw it.

It is evident, that in pulling a tooth, the more you elevate the tooth by pulling it as it were directly upwards, the less injury you do to the socket and neck of the tooth itself, as well as giving the patient much less pain. The instruments commonly in use for extracting the teeth are keys of various shapes; differing particularly

ly in their heels or fulcrums. The best are represented Plate 7. Fig. 14. 15. 16.

When a tooth is to be extracted from the lower jaw, the patient must be seated in a chair opposite to a clear light, with his head supported by an assistant; but, if the tooth happens to be in the upper jaw, then the patient must be seated upon a cushion on the floor; the operator sitting or standing behind, the patient's head must be turned back, and supported on the thighs of the operator; the gums of the patient must be separated from the neck of the tooth on both sides, quite down to the alveoli. The operator then takes the key, of which the heel or fulcrum has previously had linen rolled about it to preserve the parts from being bruised by the hard metal. After the patient has cleaned his mouth of blood, the operator is then to introduce the instrument within the mouth, fixing the claw as low down on the outside of the neck of the tooth as possible. It ought even, if possible, to be in contact with the upper part of the alveolus; whilst the fulcrum of the instrument resting on the opposite part is not more than a quarter of an inch below the upper body of the gums. The operator is now to turn the key with sufficient force so as firmly to fix it upon the tooth; turning his hand round, and at the same time raising

raising it, by which he also elevates the tooth, to which he gives the twist at the same instant.

In extracting the tooth, you must observe, that, if you turn your hand with sufficient force, grasping the tooth firmly, and elevating your hand at the same time, the tooth must rise from its socket, nearly straight upwards, without breaking or injuring it. If the instrument is fixed very low down upon the gum, it must always be very difficult to pull it; and in every case where the tooth has large and diverging roots, either the alveolus must be destroyed, or the neck of the tooth broke, both of which cases too frequently happen. I have often seen a strong man exert all the strength of his right arm, first up on one side, and then on the other, without either breaking the tooth or pulling it, merely on account of his not having fixed the instrument properly, although, in fixing it, he had followed the directions of the most approved modern surgeons. To his astonishment, I fixed it according to the directions already given, and extracted the tooth with ease.

In this manner we may, without much difficulty, extract all the molares, as well as every stump, ~~provided~~ its edge be so far below the alveolus, as not to admit of the instrument laying hold of it after scarifying the gums. When any part of the gum is lacerated, it may be removed by a pair

pair of scissars, and the mouth washed with a little milk and water. I do not recollect an instance of splintering the socket. Small pieces of the alveolus, indeed, have frequently come away, adhering firmly unto the tooth ; but it would be proper, if possible, to take away these before shewing the tooth to the patient.

It is seldom that hæmorrhages occur after the extraction of teeth, on account of the extreme small size of the arteries, especially in adults. In some cases of children indeed, whose arteries are larger, hæmorrhages have been known to take place. But these may be easily stopped, by filling the socket with vinegar, brandy, or spirits of any kind ; or, should these fail, the socket should be filled with styptic powder, retained for a few minutes by a small compress. I have met with five instances of this kind, and in all of them the patients were under nine years of age. The fore teeth are always easily extracted by the common tooth forceps represented Plate 8. Fig. 1. The tooth should be laid hold of as near the alveolus as possible, and then it is to be twisted first to one side, and then to the other, after which it is to be fairly lifted upwards, or pulled downwards at once. Thus there never is any danger of missing the hold, or breaking the tooth.

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## SECTION XXIII.

*EXTRACTION OF STUMPS.*

THESE are the roots of the molares, when the rest of them has been eat away by caries ; and though sometimes the stump may appear in the alveolus, yet frequently the latter fills up with flesh, so that the stump cannot be seen. These effects begin to take place as soon as the root is separated from the body of the tooth. The stumps sometimes become the seat of violent pains, even though the whole tooth should have previously wasted away with very little pain to the patient ; the jaw swelling in the same manner as is already described. If the stumps are in the upper jaw, they often occasion great pains in the eye and ear on that side on which they are. The only cure is by extracting them. The common key already described will answer the purpose exceedingly well ; or, if it does not pull them out entirely, it will at least loosen them, so that they may be easily taken out with the common punch with which the head and body of the key are kept together.

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In doing this, the patient is to be seated in the same manner as if he were to have a tooth extracted by the key. The surgeon having the punch in his right hand, is to place the forefinger of his left, having a piece of cloth wrapped round it in the inside of the mouth opposite to the stump. This must now be pressed inward very steadily, and with considerable force, until it is thoroughly loosened; and thus every stump which cannot be drawn by the key may be easily taken out by the punch; but, if they are very loose, and can easily be laid hold of, they may be removed by the forceps.

In the way now described, I have, with ease to myself, and the greatest relief to my patient, removed a great number of stumps. Sometimes I have taken away no fewer than six or eight at a time; for this reason, that the patient thought so little of the pain of extraction, and wished to have every stump he had taken away. The different instruments for punching out teeth are represented Pl. 8. Fig. 2. 3. 4.

Sometimes we meet with a patient who complains excessively of one of his teeth; and yet, upon examination, we can find no caries about it; the gums being also of a natural appearance, only that in cases of this kind they will be found considerably retracted from the neck of the tooth; by which means that part  
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of it and the upper part of the fang, which is not covered with enamel, or even with the periosteum, are exposed to the air. The sudden colds to which it is thus liable often brings on the most acute pain. The symptoms of inflammation frequently take place within the tooth itself, and by their continual increase, paroxysm is at length produced, inferior to none that takes place in any case of the toothach whatever. When a toothach arises in this way, and particularly when the neighbouring teeth are sound, we ought by no means to be hasty in extracting the tooth, although I have known this done with as instant relief as in a state of caries; but the loss of a tooth free from caries is certainly to be considered as much greater than of one that is decayed and rotten.

As this kind of toothach is to be considered as a local inflammation, so the medicines by which local inflammations are removed in other parts of the body are here very often useful also. Scarifying the gums freely, either with a lancet, or the scarificator represented Pl. 8. Fig. 7. is frequently of use here; also the application of leeches; the discharge from which, if plentiful, frequently affords great relief. But the remedy I have always found most efficacious, is a blister as nearly opposite to the root of the tooth as possible, extending from the back of the ear down

along the side of the neck, and below the jaw of the side affected. During the extremity of the pain the head should be kept warm, and large doses of laudanum may be repeatedly given, with great relief. The side of the head and cheek may also be exposed to the vapour of warm water, with great relief. But should all our remedies prove ineffectual, and the violence of the pain still continue, there is no other remedy but pulling the tooth, which puts an end to every symptom at once. As in this case the tooth is found, if it be any of the small molares, which have but one root, whether in the upper or under jaw; as those, I say, have but one root, or even any of the four large under molares, which never have more than two, and these are seldom found subject to much divergency, as the tooth extracted is found; as soon as you have fully seen that it is so, it ought to be carefully put back into its socket. In the small molares, which have but one root, this matter is easily accomplished; but, when there are two fangs, it must require more caution and dexterity to make each of the fangs enter the proper place, in the direction they were in before pulling; but, if you proceed with care, the tooth must be pressed down to the bottom of the socket with considerable force. In this way, a small bit of cork is to be cut and put between this tooth and its opposite,



posite, when the patient is to shut his mouth with considerable force upon the cork ; and the surgeon assists, by pushing the jaws close together. This must be done with a little jerk, and by this means the tooth will presently go to the bottom of the socket.

I have returned many teeth after they were pulled, and all these are at this time as sound as the day they appeared above the gum. One gentleman has three that were all pulled, and returned eight years ago ; the enamel of one of them is begun to decay ; but the tooth itself, as well as all the rest of them, are quite sound and firm. I have not found it necessary, in any case, to put the patient to the trouble of having his tooth tied to any of the adjacent ones. It was only necessary for him to keep his mouth shut, and to live upon soft food during the cure.

The toothach cannot be produced by any affection of distant parts ; nothing less than inflammation or caries of the tooth itself can produce this effect. The whole head may sometimes be affected by a foulness of the stomach, but never a particular tooth ; and this affection of the head may always be cured by a vomit. There is a particular species of intermittent headach, which affects one side of the orbitary sinuses ; and sometimes the eye and antrum maxillar of the same side. Sometimes it is communicated from these  
parts

parts to one of the large molares of the same side ; but neither is this properly the toothach. It is always easily distinguished from any other complaint, by its attacking regularly the eyes, sinuses, &c. at a certain hour every day. It begins first with chilness and slight pain of the head. When these have continued a short time, the heat, pain, and uneasiness increase to a great degree. These continue for several hours, after which the pain gradually diminishes, and the patient continues well until next day at the same hour. At that time it comes on again, and usually continues half an hour longer than the time before. In some cases the pain has been protracted from three to eight hours ; always increasing in violence as in duration. In cases of this kind, no medicine that ever I have tried is equal to a drachm of the bark, with five grains of powder of crude sal ammoniac, given every hour and half for twelve hours before the fit ; and, by persevering in this method every day, I have never failed to remove every symptom of the disease in four days ; but, in order to prevent a relapse, the patient is obliged to take a powder every three hours for a few days more, to prevent a relapse.

If the patient's stomach should happen to be out of order, it will be proper to exhibit a vomit ; and if it should not operate downwards, a  
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gentle laxative is to be given next morning, to cleanse the primæ viæ. This is the only mode of practice that can be adopted with propriety in the disease just now described, which is entirely different from the real toothach, as being attended neither with caries nor inflammation of the tooth affected. It will be obvious to every intelligent practitioner, that, if the disease itself be removed by any internal medicine, every symptom affecting the tooth must cease of course. A surgeon might be called to a patient in the height of the distemper above described; but, should he be so injudicious as to extract the tooth, still he would not cure the disease; for next day the same symptoms would recur with equal violence; one symptom only, *viz.* the uneasiness of the teeth, being relieved.

Hence we see that it is necessary in the toothach to ascertain the cause of the pain, otherwise we may err in the cure. During the first months of pregnancy, women are frequently subject to pains in different parts of their bodies, and particularly to the toothach. The pains are relieved by general blood-letting, as the toothach is by topical; the pains in the teeth here being only a symptom of another disease, probably a plethora of the system. It is evident here, that neither pulling the tooth, blistering, or opiates, could be  
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of any service, neither would any judicious practitioner ever think of having recourse to them.

## SECTION XXIII.

### OF THE TRANSPLANTATION OF TEETH.

THIS is practised in order to prevent deformity, and has usually been done by professed dentists; though every surgeon of any dexterity, or neatness of hand, may do it as well as they. Before we perform this operation, however, it will be necessary to consider, in the *first* place, the age of the patient; *2d*, whether the alveoli and gums are in a perfectly sound state, and the patient free of disease otherwise.

It is to no purpose to think of performing the operation with success upon any person upwards of 40 years of age; for, by this time, the gums have not only separated considerably from the roots of the teeth, but the alveoli themselves are considerably wasted, or less deep than usual; whence it is obvious that transplantation can never be performed to advantage, but when the person is young, and in the prime and vigour of life. Neither can we hope for success if the constitution of the patient is tainted either with  
lues

lues venerea, or some other disease. Gum boils, opposite to the roots of the diseased tooth, are likewise unfavourable ; for, as they are frequently of very long duration, they are of the worst consequence imaginable ; and, in cases of this kind, it will be to no purpose to perform the operation ; for the socket being here diseased, we cannot suppose that any transplanted tooth will ever fix in it.

This is all that is necessary to be observed with regard to the patient ; but, with regard to the subject from whence the tooth is taken, too much caution cannot be used. These are generally not only of the lowest orders of society, but such as are so depraved that they will hire out their bodies for any purpose, so that very dreadful diseases may sometimes be communicated from them. It is certain that the venereal disease may be communicated in this way, though no symptom of it appear at the time. Mr Foote, in his lectures on the venereal disease, mentions a case in which the subject from which the tooth was taken appeared to be perfectly sound ; yet, in fourteen days, small ulcers began to appear on the gums of the person into whose jaw the tooth was transplanted, after continued pains in the socket all that time. These ulcerations increased ; and, as the tooth was in the upper jaw, not only the alveoli became diseased,  
and

and carious, but the whole of the upper jaw also. The unhappy patient was now seized with a symptomatic fever, at the termination of which several corroding cavernous ulcers made their appearance, as well as nodes on the body and tibiæ, attended with exquisite nocturnal pains; and, in this miserable situation, she died in a short time, notwithstanding the administration of mercury, and every other remedy that could be thought of, by the most experienced surgeon of his time, *viz.* Mr Pott.

In a future Treatise, we shall endeavour to shew that the venereal disease may be conveyed by the blood, as well as by matter, and that it may be conveyed by the semen also; and, of consequence, how necessary it must be, however difficult the task, to ascertain, or at least render probable, the chastity of the person from whom the tooth is taken.

As the transplantation of teeth is performed merely to hide deformities, the operation is confined chiefly to the incisors and canine teeth; sometimes also it is practised on the small molars, but never on the larger. The success depends on the circumstances already mentioned, and likewise on the alveoli being in a very sound state. Hence, if the teeth have been long in the state of stumps, there is little hope of success; as the roots commonly diminish greatly  
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in size, and the alveoli are diminished in proportion.

It is a matter of the utmost consequence that the transplanted tooth fit the socket as exactly as possible, yet without requiring a very great force to push it into its place. For this purpose, it has been recommended, that several people should be ready to furnish teeth, that the operator may have a choice; but this must always be difficult to procure, and, besides, increases the danger of contracting disease in proportion to the number of those from whom the teeth are taken. If the tooth to be transplanted is too large, it may be filed down till it becomes of a proper size; for this is found not to hinder the fastening of the tooth as well as though no such operation had been performed. It is evidently proper, however, that the surface of the transplanted tooth should be on a level with the rest, or rather a little lower; though, if it be any lower, it must be scarcely perceptible; for it must be some inconvenience to have a tooth lower than the rest, as well as to have one higher than the rest. It is always to be supposed that the tooth to be transplanted is sound, and not broken or damaged in the pulling. It does not appear that there ever can be any necessity for tying the transplanted tooth to the two contiguous ones, as

some have recommended, or that it ever can answer any good purpose.

## CHAP. XV.

### *DISEASES OF THE EARS.*

**A**LL diseases of the ears, however various in appearance, may be reduced to two kinds, viz. such as arise from natural defects in the parts themselves, and such as are occasioned by extraneous bodies lodged in the meatus externus. A very common natural defect is when the meatus auditorius is imperforated. This may happen, either by the sides of the passage growing together, or from the cavity being filled up with a fleshy matter. Here nothing can be of any use but the removal of the cause, whatever it be. When the meatus is covered with a membrane, the latter may be divided with a crucial incision, by means of a lancet, after which the air will have access to the tympanum. If the sides of the auditory passage are coalesced, the only thing we can do, is to endeavour to separate them. In attempting to perform this operation, the patient must be seated in a clear light, with his head properly secured by an assistant, when the surgeon,



surgeon, with a narrow pointed scalpel, is to endeavour to separate the sides of the external opening, through the whole length of the adhesion. The external meatus auditorius is a cartilaginous tube, nearly an inch in length from the external open to the tympanum, and of such a size as to admit a large goose quill externally, but gradually contracting as it goes inward; so that, from the length of the tube, and its narrowness, we cannot be in any danger of wounding the tympanum while we attempt to open the tube. It would not, however, be advisable to go deeper with the knife than half an inch, if there be no appearance of an opening lower, until the place where it is already opened be healed; and this can only be done by the introduction of a piece of bougie, or other round substance, which will prevent it from closing again. But whatever substance is used for this purpose, it must be previously well oiled, and care taken to keep it clean, by taking it out and wiping it twice a day at least. When the auditory passage is filled up with a fleshy matter, there can be but little hope of restoring the hearing. The only thing we can do, is to attempt the extraction of the fleshy substance like the polypi of the nose; and if we succeed in extracting this whole, there are hopes of success; but if, any part of it is left,

left, it is evident that the deafness must still remain.

Sometimes extraneous bodies are forced into the ear, and sometimes insects get into it. The creature called forficula or earwig is said to make its way into the ear, and to occasion not only deafness, but violent pain by its biting ; and there is an instance on record of a woman, in whose ear a nest of these insects were lodged, and reduced her to the greatest distress. Children are sometimes apt to put pease, cherry-stones, &c. into their ears ; but these may easily be extracted by a crooked probe, or a pair of forceps. With regard to insects, particularly the forficula, oil is an infallible remedy. Indeed most insects are destroyed by oil ; but it is peculiarly fatal to the forficula. After the insects are thus killed, they may be brought away by injecting warm water.

Sometimes wax collects in the ear in such quantity as to obstruct the hearing ; in which case, the proper remedy is to wash it out with warm water, having a little soap dissolved in it by means of a syringe. Sometimes deafness may be occasioned by a deficiency of wax ; and in this case, a little oil of almonds dropped into the ear once or twice a day has been known to prove useful, as well as soap, galbanum, &c.

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put into the ear, which are supposed to act by the stimulus they give to the parts.

Frequently, in scrophulous habits, suppurations are met with in the glands of the neck and under side of the ear, close by the bones of the head; and sometimes in affections of this kind, instead of breaking externally, the matter penetrates betwixt the external ear and its connections with the temporal bone; being discharged by the external opening of the ear; while, at other times, in habits of the same kind in children, we find them affected with severe pains in the passage itself, which, at last, terminate in suppuration, in spite of every attempt to prevent it. In both these cases, the last especially, after the suppuration has continued for some time, we frequently find an excrescence, which is often mistaken for a polypus; but this is no more than the luxurious fleshy granulations arising from the parts affected at the bottom of the ear by the excoriation of the matter. In cases of this kind, a little burnt alum, or Roman vitriol in fine powder, may be blown into the ear through a quill, upon these granulations, with great advantage; and, after these have been allowed to remain some length of time, they may be gently washed out with a little lime water.

Some

Some of the fungi arising from this cause are not unlike the polypi of the nose in their shape and manner of attachment to the parts, by means of a long narrow neck, and broad basis. In this case, the patient is often very deaf, sometimes irrecoverably so, not from the fungus itself, but from the tympanum being destroyed by the acrimony of the matter. I doubt much whether any other kind of polypi ever take place; though several eminent authors have mentioned them as fleshy excrescences filling up the meatus auditorius, as we have already noticed. I am indeed inclined to believe, that polypi never take place but in those parts of the body that are copiously supplied with small blood-vessels. These, from their situation, and from the heat and moisture to which they are exposed, frequently become much relaxed; nay, sometimes the small vessels are actually ruptured, and pour out their blood copiously. Hence, real polypi are found only in the nose or back of the throat in men, and the vagina in women; these parts being fitted, not only from their heat and moisture, but the great relaxation of the vessels, to favour the growth of polypi. But the meatus auditorius is neither supplied with so many blood-vessels, nor with such abundance of mucous matter. Hence, there never are any real polypi formed here. All the excrescences  
formed

formed here are probably consequences of exco-riation, and arise near the bottom of the passage. But, if neither the aluminous nor vitriolic powder, nor washing the parts with lime water, or other astringent liquors, have any effect on the tumor, we may attempt to remove it, either by the point of a very fine bistoury, or by a pair of fine scissars. If the latter are used, you must introduce them closed. After they are at the root of the tumor, they may be opened, and the neck removed with great ease.

Thus any excrescence arising in the meatus auditorius may generally be removed. Several cases of this kind have fallen under my care, and most of them got well merely by using mild escharotics; though, in some instances, I was under the necessity of taking off the tumors with the scissars, which I did with great ease; for, as there are but few blood-vessels here, there is little or no danger of an hæmorrhage; and this may be got entirely the better of, by injecting a tea-spoonful of tincture of kino, mixed with two of plain water; which will also be found of great advantage in checking the purulent discharge, and promoting the healing of the parts.

But, should the fungus affect the sides of the tube in such a manner as nearly to shut it up, and every endeavour to free it should prove abortive, we may, with considerable hope of success,

cess, cautiously make use of a bougie, introducing it quite to the bottom of the external ear; taking care, however, not to touch the tympanum, as this might be attended with disagreeable effects. The bougies should be frequently removed, and every time they are so, the parts should be well washed with a little lime-water blood warm. Thus affections of the ears which endangered deafness have often been cured.

Should it be necessary to use any instrument for clearing the auditory passage, the patient must be seated in a clear light, the head being supported by an assistant, and the external ear held in such a manner that the light may fall into the very bottom of it; if the rays of the sun can be made to do so, it will be found of the greatest use in performing any operation upon the ear.

In washing the ears as formerly directed, when too great a quantity of wax is collected, we may advantageously use an ear-picker, such as is represented Plate 8. Fig. 8.; for, if a strong light be made to fall into the bottom of the meatus auditorius, we will easily see it of a black colour, and much of it may be picked out with great ease. The patient is then to be placed in a chair, with his head reclined on the breast of an assistant, who at the same time holds the basin in which is the liquor for washing the ear directly

directly under it ; so that every thing that comes out of the ear may fall back into the basin, as well as the water itself which is injected, so that the patient may be as little wetted as possible ; which ought also to be further prevented, by laying upon the neck and shoulders several folds of linen. The operator then fills his syringe ; and holding the syringe between the fore and middle fingers of his right hand, with his thumb in the ring of the piston, he endeavours, with the left, to bring the external opening in the ear and auditory passage into a straight line with each other. He then throws in the water slowly for the first two or three syringe-fulls ; but, as soon as the wax begins to come away, and break in pieces, more force must be used, and the syringe directed in such a manner as to throw the water to the very bottom of the tube. Thus the whole of the wax will be driven out at once in a long round piece, fitting exactly the cavity of the tube. I have frequently met with a piece of this kind half an inch in length. But, after such pieces are fairly removed, and the passage nearly clean, if you throw in any more water, it must by no means be done with such force as the former ; even with the utmost caution you can use, a very disagreeable sensation is communicated to the tympanum now freed from the wax. If the force with which

the water is injected be great, it is plain that the tympanum itself may be in danger of being burst, or much injured; so that as soon as the ear is clean of wax, all further injection of water must be omitted. After the operation, the ear should be immediately stuffed, but gently with fine wool, by which the air will be prevented from entering freely, while at the same time the admission of sounds will not be much impeded.

This is the most general, and the most easily removed cause of deafness. When it is occasioned by any morbid state of the parts of the internal ear, it is plain that it must be much more difficult to cure. If the hearing is completely destroyed, the patient must be placed in the sun, and placed so that the rays may fall directly upon the bottom of the auditory passage. If the tympanum be found, it will be seen like a plate of fine polished horn, such as is used instead of glass. But, if it be destroyed, you will probably perceive a small hole at the under edge; or the whole of it may be destroyed; and, in this last case, you will perceive the borders of it of a yellow colour, about a line in breadth; the opening looking into a dark cavity, which is that of the internal ear. In such deplorable cases, nothing but keeping the parts clean can be  
of



of any service to the patient, and endeavouring also to heal them by mild astringent injections.

Complaints of this kind originate commonly from a scrophulous habit of body; and the utmost care ought to be taken, on the first appearance of any discharge from the ears of children, to keep the parts clean, so that they may not contract any offensive smell, and to promote the healing of them by every possible means. For this purpose, a little warm wine may be used, a weak solution of sugar of lead, or the mixture of gum kino already mentioned; all of which, however, may be somewhat varied occasionally; the ear being gently washed with a syringe thrice a-day. After each washing, I have found it of advantage to use equal parts of tincture of myrrh and kino mixed. Ten drops of the mixture is to be put into the ear, down to the very bottom.

If the discharge has been of long standing, and in considerable quantity, it will be proper to keep open a small blister issue, about the size of a crown piece, for some time, by which the cure will be very much promoted, as well as a return of the disease prevented. The intention, in cases of this kind, is to prevent the destruction or too great relaxation of the tympanum, or other parts essential to hearing. There are here two things to be attended to, the neglect  
of

of which has often been attended with the most miserable consequences to the patient, and in a manner deprived him of every comfort of life.

1. In many people, especially those advanced in years, from long exposure to extreme cold, the tympanum becomes affected, and a noise is perceived by the patient, in one or both ears, like the rushing of water, which is always increased by cold. In other cases, the noise is less distressing, and the patient, by paying attention, can distinguish pretty accurately the words of one person who addresses him at a time; but, in mixed companies, or even if a single person address him in a loud tone of voice, the tympanum is struck by a confusion of sound, and he can hear little or nothing distinctly.

As all these affections depend on the same cause, viz. a relaxation of the tympanum from cold or otherwise, we must not here attempt to cure the disease by syringing the ears, unless, on examining them, we find the wax very distinctly, which, from my own experience, I know is seldom the case. But, when the hearing from affections of this kind becomes very much impaired, it is often assisted by mechanical means. Many instruments have been contrived for this purpose; but none answer equally well with that resembling the common horn, and represented Plate 8. Fig. 9.

If

If we have any reason to suppose that the deafness may have arisen from any defect in the natural secretion of the wax, a few drops of fine oil olive may be dropped into the ear as formerly observed; or we may try, with advantage, a few drops of a strong solution of Castile soap.

Perforating the lobes of the ears, was formerly accounted part of the surgical profession; but the method is now well known to every toyman of any consequence in Britain or Ireland, and it is, of consequence, become a part of their profession. It is never done but with a view to ornament, and the wearing of earrings. But, as these ornaments, if heavy, would be apt to tear out the parts, it will always be proper to make the perforation as far up as possible on the lobe of the ear; and, to avoid mistakes, the part where the perforation is to be made ought to be previously marked with ink. The patient then being properly seated and secured, the lobe of the ear being stretched upon a piece of cork, is to be perforated with the instrument represented Plate 8. Fig. 10. the cork being then taken away with the point of the instrument sticking in it. A small piece of leaden wire must then be put through the tube remaining in the ear, and left in the perforation; rubbing it with oil, and drawing it backward and forward in the orifice, which will soon make the sides of the latter

latter callous, and the ear-ring may be put in place of the lead.

## CHAP. XVI.

*OF THE WRY-NECK.*

IT is not very uncommon to see the head turned to one side, apparently by the contraction of the muscles of that side to which it is turned; and this is called *wry-neck*. It may proceed from different causes. 1. It may be owing to a bend of the vertebræ of the neck, and their ligaments. 2. To a morbid affection of the muscles of one side of the neck; particularly of the *sterno-mastoid muscle*. When, by any accident, or disease, one of these muscles loses its power, the other, which continues to act with vigour, will pull the head to one side; and, if this be neglected at first, a lasting contraction will take place, which cannot be cured by any other method than a surgical operation. 3. In cases of severe burns, the chin is often laid down upon the top of the sternum, and adheres to it by an inflammatory concretion of the parts; so that the patients never can raise their heads.

Affections

Affections of the vertebræ of the neck always begin with a slight pain, and are supposed to be occasioned by some slight twist, or straining of the parts, during sleep. The pain, however, still continues to increase, and the head is always turned to that position in which is the least pain, in which posture the patient keeps it very carefully. But, instead of finding relief from this, or any other position, the pain still continues to increase; and, if the spot at the back of the neck be cautiously examined, a fulness will be found, for the most part a little below the hollow, betwixt the occipital bone and the first vertebra of the back, very painful to the touch; and now, upon attempting to move the head in the smallest degree from side to side, the pain becomes exquisite; nay, even the motion of the head backwards and forwards, proves extremely painful, if not altogether impracticable.

In cases of this kind, after having tried all means to alleviate the pain, and at the same time reduce the swelling by proper remedies, the only method which was ever known to be effectual, is the introduction of two small pea-issues, one on each side of the tumor, which are to be kept open till all the pain and stiffness is gone off. In this way I have had the happiness, in two different instances, to restore my patients to the free motion of the head and neck, after hav-

ing

ing been deprived of them for fifteen months. One of my patients was seven, the other nine years of age ; both of them of a scrophulous disposition, though it never discovered itself in any other way than this.

When the muscle only is affected, there is an absolute necessity for dividing it, in order to take off the deformity. When the operation is to be performed, the patient must be seated in a chair of a proper height, opposite to a window, with his head resting on the breast of an assistant. An incision must then be made through the skin, immediately above the muscle, about one inch above the sternum. After having divided the skin completely, till the muscle is thoroughly in view, the fibres are to be cut across till the whole are divided, after which the affection of the neck, if it depended on this muscle, must be entirely removed. The wound is to be dressed in the usual way, with a pledget of wax and oil. During the cure, it will be necessary to secure the head in such a manner that the deformity may be entirely removed. The instrument proper for performing this operation is represented Plate 8. Fig. 11.

If the contraction is only in the skin, which some authors say is most commonly the case, it must be divided through the whole of the affected part, till every part of the adhesion is thoroughly

roughly removed, and great care must afterwards be taken to prevent a relapse. The head, in cases of this kind, must be supported from behind.

Mr Gooch mentions a case, in which he cured a contraction of the neck without any operation. This, however, did not happen in consequence of any natural defect of the constitution, but was occasioned by a fall from an horse, in a young woman. When brought to him, long after the accident, her chin was fallen upon her breast, "and from the friction by an involuntary and constant vibrating motion, the skin was fretted off both these parts; which, with the pain she suffered upon the posterior part of her neck, made her life very uncomfortable. Various applications and bandages had been tried for two years, to no purpose. I gave directions for making the machine represented Plate 8. Fig. 12. by the use of which alone, the relaxed parts recovered their tone and action, and she was perfectly cured in six months. By the same contrivance, I have since cured a similar case of a year's standing, only the oscillation of the head was not quite so much."

Mr Gooch is likewise of opinion, that a machine of this kind, with a branch to pass up on each side of the head, might prove useful for keeping the head and neck in their proper di-

rection, after the operation for the wry-neck. He never had any opportunity, however, to make trial of this in common wry-neck ; but found it particularly serviceable in several cases where the operation could not be practised ; especially in one, where the disorder proceeded from a distortion of the cervical vertebræ, with a great thickness of the muscles, which came on after a fever. In this case, a consultation of surgeons had determined to divide the sterno-mastoideous muscle, which was not at all affected, but Mr Gooch convinced them of their mistake.

## CHAP. XVII.

### *DISEASES OF THE NIPPLES.*

SORE nipples affect women more generally in their first child than afterwards ; and even here it is mostly on account of the smallness of the nipple when the breast becomes distended with milk, which happens commonly on the second, but always on the third day after parturition. In proportion to the distention of the breast, and the small size of the nipple, the child has a difficulty of sucking ; so that, in some cases, it is altogether impossible for it to do so. If this im-

pressibility,



pressibility, or even a very considerable difficulty continues for any length of time, the continual efforts of the child will render the nipple sore. In some cases the nipple can be pressed out by the mother between her fore and middle fingers, keeping back at the same time the milk with the same fingers as much as possible. In this case, should the young child not be able to suck, an older child will probably fix immediately if applied to it; and, after it has sucked for some time, the nipple will probably be drawn out so far that the young one will be able to suck.

If the young child fixes, and the nipples are thus drawn out, nothing more will be necessary, as they will now be softened; and the mother should be taught to keep them so by milking a little of her milk upon her finger and thumb, and wetting them with it. There are, however, some nipples, which are not so easily softened, and drawn out; or it may be impracticable to procure a grown child. In order to prevent the bad consequences which might ensue from circumstances of this kind, the surgeon ought always to be provided with a number of glass tubes, to be applied to the breast, with receptacles to contain the milk. Those best calculated to answer the purpose resemble a tobacco pipe, with a large receiver immediately behind the head,

head, for holding the milk that is sucked out. The mouth of the pipe is to be placed immediately above the nipple, and which should be a little larger than the nipple itself. This being done, the glass is to be pressed close to the breast, whilst the patient herself, or her maid, taking the other end in her mouth, sucks the milk out of the breast with great ease. Thus the nipple will at length be drawn out, and the child will suck freely, if this method be persevered in only for a few days.

Instruments of the kind just now described must be preferable to any of the elastic gum kind; for the suction of the latter can never be sufficiently great to overcome the tension of a fully distended breast; and that this is really the case, I know from repeated observations. When the breasts discharge the milk of themselves without suction, or with very little, the elastic guminstruments may be used for emptying them, which they will very easily do; though they will not answer the purpose of elongating the nipple, that the child may suck freely.

The nipples are very apt to chop or crack in the first lying-in; and so very subject are some women to affections of this kind, that they tremble for the consequences of attempting to nurse. These chaps are extremely painful, and frequently spread to a considerable extent, putting on at least

least the appearance of a superficial ulcer, which becomes exquisitely painful, by reason of the peculiar delicacy of the structure of the nipple, and is almost intolerable when the child is put to the breast. When a woman has once suffered in this way, if she happens to be with child again, and intends to nurse her child, she ought, previous to her lying in, to bathe her nipples frequently with equal parts of brandy and the best white wine vinegar ; or a pretty strong solution of alum in water or diluted spirit ; or to put round the nipple and its root a small slip of linen spread with an ointment composed of equal parts of auxunge and powder of galls, washing it also morning and evening with a little brandy and water. Thus, I think, much pain and trouble might be avoided after delivery, as by these medicines the tender skin of the nipple would be very much strengthened. Great care ought also to be taken that the nipples be not hot or too moist with any thing that may soften or relax the skin too much. If this happens to take place, an excoriation of the nipple is the consequence, almost as soon as the child begins to suck.

The nipples are also frequently affected in consequence of affections of the mouth of the child. Some parents, as well as nurses, are inclined to give the child food as soon as it is born ; but  
the

the consequence of this in most cases is, that the child's stomach becomes oppressed, and its mouth apptous and very hot, and painful. This affection of the child's mouth is quickly communicated to the nipple; and in this manner I think that I have been able to trace many of the affections of the nipples which I have observed; none of which could ever be completely cured, as long as the child's mouth continued affected.

In affections of this kind I have frequently, with the utmost success, washed the nipple with a little Riga balsam, dressing the part afterwards with some Turner's cerate fresh made, and having the lapis calaminaris well levigated. With this the part is to be dressed every eight hours; and during the time that this is continued, the child is not to be allowed to suck oftener. We may also wash the nipple with a little Port wine warmed, without any dilution, dressing it afterwards with a little of the unguent. cerussæ acetat. every time after the child has sucked; and it is always proper that the nipple should be washed after the breast has been dressed, just before the child is put to it again, because the remains of the ointment might hurt it, if not carefully washed off. For this purpose we may use either warm Port wine, brandy mixed with equal parts of vinegar, or a very weak solution of alum, but all of them warm.

During

During the time the nipple is affected, but especially while the dressing is continued, small tin nipple cups are very necessary, as well for keeping on the dressings, as defending the nipples from the friction of the clothes, &c. In this way I have cured a great number of patients, and am persuaded, that, if the directions above given be properly followed, there will be very little danger of proving unsuccessful in any case.

## CHAP. XVIII.

*OF ISSUES.*

THOSE are a kind of artificial ulcers formed in different parts of the body, from whence we procure a discharge of purulent matter, which is frequently of considerable advantage in many sores, swellings, &c. It was formerly a prevailing opinion, that issues served as drains to carry off the noxious humours from the blood. But this opinion being erroneous, gave rise to errors in practice; for, on this supposition, they were placed as near to the affected part as possible, without regard to the propriety of their situation; for it is by no means proper to place them any where at random on the surface of the body.

The

The proper place for them is where there is a considerable depth of cellular substance ; therefore, they may be put into the back of the neck, either across, when a seton is used, or upwards and downwards. They may be also put into the humerus, in the hollow immediately below the insertion of the deltoid muscle. They may also be placed immediately above the joint of the knee, on the inside, just in the middle between the flexor tendon of the leg and the vastus internus. They may also be inserted in the interstices of the ribs ; and frequently are placed with great success on each side of the spinous processes of the back, when these are prominent. But they must never be placed above the belly of a muscle, directly above a tendon, nor upon any thinly covered bone, or near any large vein.

The most simple issue, and, at the same time, that which has the greatest discharge, is the common blister issue. The best situation for this is the top of the head, or the middle of the breast or humerus. After having removed the blister, a piece of cloth, either round or square, according to the size and figure of the place you wish to keep open, is to be spread with ointment, in which some fine powder of cantharides is mixed. But, if the discharge should at any time become too copious, or the part be much inflamed, the  
ointment

ointment must be laid aside for a day or two, and the sore dressed either with basilicon or Turner's cerate, till the discharge is diminished, or the inflammation gone.

A *pea* issue may be formed in two ways, either by making an incision with the point of a lancet completely through the skin, of a size sufficient to admit one or two peas, or we may make use of caustic. But, in this latter method, it is obvious that the operation must always be more slow and tedious, than when done with the lancet or scalpel. The common caustic, or lapis infernalis of the shops, answers the purpose better than any other. It ought first to be reduced to a paste, with a little water or soft soap. As much of it should then be applied to the place where the issue is to be formed as will make a sufficient opening; but it is apt to spread; and, to prevent this, a piece of leather, spread with Burgundy pitch, with an hole in the centre, should be put upon the place where the issue is to be made. The caustic should be put upon the small hole in the centre. Another piece of leather, spread likewise with adhesive plaster, should be put over the whole. The whole may be taken off in about ten or twelve hours; and, in the space of a few days, the eschar will separate, when the hole which it leaves may be filled with peas.

In many cases, particularly in affections of the head, nose and eyes, and in copious discharges of purulent matter from the lungs, setons have been recommended. When these are meant to give relief in affections of the lungs, they ought to be put between two of the ribs, but never across them. The cord ought to be made of cotton or silk; and, when it is to be introduced, must be put through the eye of the needle, represented Pl. 6. Fig. 12. That part of the cord immediately to be drawn through must be well anointed with any kind of mild ointment, the extent of skin through which it is to be passed being marked with ink. The skin between the two points marked with the ink is to be lifted up till the two spots come opposite to another. The one side of the skin is to be supported firmly betwixt the finger and thumb of an assistant, whilst the surgeon supports the other. The point of the needle is then to be introduced into one of the spots, and pushed through both folds of the skin through the other spot. When the skin is let go, then the needle must be cut off, and the parts dressed. An inch or two of the cord must always be left, in order that the seton may be so dressed, that there can be no danger of its being withdrawn. Thus, matter is produced in quantity proportioned to the degree of irritation,



tion, to increase which it will sometimes be necessary to mix cantharides with the ointment.

In some countries of the East Indies, they remedy deep seated pains by burning down the part affected to the bone by a soft downy plant called moxa. This is put upon it in a conical heap; and fire being set to the upper part, it quickly burns down to the bottom, and has a proportionable effect on the parts below. If it does not burn deep enough at first, the operation is repeated. This mode of cure has never come into practice in Europe, but is said to be very efficacious in the countries where it is in use. Fine flax, according to some authors, might answer the purpose of moxa, or cones of fine cotton might be tried.

## CHAP. XIX.

### *INOCULATION FOR THE SMALL-POX.*

THIS operation, not many years ago, looked upon as very formidable and dangerous, is now reduced to great simplicity, and practised every day without the least fear or danger. The uses of this operation are so well known, that it would  
be

be superfluous to say any thing concerning them here ; we shall therefore only describe the best method of performing it. This has of late years received a great improvement. Formerly, it was done by making an incision through the skin of about half an inch in length, and then laying into the small wound a bit of thread already dipped in variolous matter. The thread was retained several days, by means of a bandage, and small-pox soon began to appear. But this method was thought too painful for children, who are generally the subjects of the operation ; besides, that the wound was very apt to degenerate into a troublesome ulcer ; therefore the matter is now only insinuated between the cuticula and cutis vera, by means of the point of a lancet. The matter ought always to be taken from a healthy child, whose parents are also healthy, from a distinct natural small pox, or from a successfully inoculated one. It may advantageously be taken from them which first takes place on the inoculated spot, where this can be had, or from a natural small-pox, about the fifth or sixth day of the eruption ; but, from whatever subject it is taken, it ought always to be in a perfect state of fluidity. It ought to be taken, if possible, on the point of the lancet with which we intend to inoculate, and to be inserted as quickly as possible into that part of the body which we mean to infect ; for,

it is evident, that the fresher the matter is, the sooner and more effectually will the effects we expect from it take place. If, however, the matter has been thickened, by keeping for any length of time before the operation could be performed, it must be softened with a little warm water, or by steam, before it is used.

The operation of inoculation may be performed on any part of the body; but, for several reasons, I think the arm preferable. You lay hold of the child's arm, and insinuate the infected point of the lancet, about one eighth of an inch, between the cuticula and cutis vera, the length of at least one inch or more above the elbow joint, keeping the point of the lancet in this position for about a minute, pressing, all the while, the under side of the lancet pretty firmly against the cutis vera. We may make a similar insertion about half an inch distant from this on the same arm, turning down the opposite side of the lancet to the cutis vera, by which the matter will be taken from the other side of the lancet. Thus, if the matter is not entirely destroyed, by being kept too long on the instrument, it is impossible for it once to misgive; and, in this way, there is no necessity for softening the matter, it being at once conveyed below the skin, and, by being kept there for a minute, adheres to the cutis vera; and, if care is taken in withdrawing the lancet, by  
pressing

pressing on its point with the thumb, it will be left there.

Nothing is necessary to be done after the operation in this way of inoculating. The wound is scarce perceptible. On the third day, we almost always perceive a small red pimple upon the inoculated spot. This pimple gradually increases, and becomes one of the small-pox, sometimes on the seventh, but generally on the ninth day. Inflammation round the basis succeeds, with sickness, restlessness, heat, and quick pulse. These symptoms continue for one, two, or three days; after which, the general eruption takes place, and they cease, the patient feeling little inconvenience during the progress and cure of the disease.

It has been a matter of dispute whether inoculation ought to be performed in very early infancy, that is, when the child is a month old, or whether we ought to wait till it has attained the age of three or four years. The most plausible argument used by the advocates for early inoculation, is the danger that the child is in of catching the infection naturally, while we are waiting for a proper opportunity to inoculate him. On the other hand, it is argued, that, during the first month, a child is too weak to bear the eruption. In all probability, the propriety or impropriety of early inoculation must  
depend

depend upon circumstances. If the child is strong and healthy, there is no doubt that we may inoculate very early ; but, if it is weak and sickly, the operation ought to be delayed.

CHAP. XX.

OF A DISTORTED SPINE.

**D**ISTORTIONS of the spine are sometimes occasioned by external violence, but more frequently are the effects of a weakly or diseased constitution. The deformity produced by them is excessive; and besides, when they come to a great height, they are apt to injure the health, and even to bring on palsies of the lower limbs, by the compression upon the viscera and nerves which supply those parts.

It is most commonly about the time of puberty that the spine begins to be distorted, though it not unfrequently also happens in infancy; but the symptoms with which the distortion begins are much more quick in infants than in those of a more advanced age. These are suddenly deprived of the use of their limbs; but, in those who are older, the patient complains for some time of numbness and weakness in the

extremities, before the paralyfis comes on. This increases by degrees, until at last he cannot walk easily, but drags one of his legs after him, and at last loses the power of them altogether. This takes place sometimes in a few days, but sometimes is more slow, and is accompanied with various other symptoms, such as dyspnoea, &c. according to the manner in which the spine is distorted.

It is not always easy to discover the cause of a distortion of the spine. Sometimes it is thought to proceed from a thickening of the ligaments of the vertebræ; but, in general, one or more of the vertebræ are moved out of their places, without any apparent cause. This again is thought to be occasioned by the patient being inclined to some particular posture, which, in weakly habits, ought by all means to be guarded against.

As long as the disease continues in an incipient state, we ought to attempt a cure by invigorating the system, by means of the bark and other tonic medicines; but, when once the malady has made considerable progress, we can have but little hope from any thing taken internally. Mr Pott supposes the paralytic symptoms to proceed not from the mere curvature of the spine, but from a diseased state of the parts.

On

On dissection, he found the ligaments sometimes thickened; sometimes the bodies of the vertebræ a little increased in size; and sometimes that they were invaded with a caries, or in a state evidently tending to a caries. In case of an enlargement of the bones, the ligaments were in a relaxed state, and still more diseased, as well as the cartilages, when there was any tendency to a caries. In a confirmed caries the cartilages were destroyed, and a sanious matter lodged on the surface of the membrane containing the spinal marrow.

With regard to the cure, Mr Pott has an high opinion of the utility of issues, and prefers those made by caustic. He took the hint from observing that a young man, afflicted with this disorder, was restored to the use of his limbs by an accidental abscess which broke out near the part affected. His reasons for preferring issues made by caustic to all others I shall give in his own words. "A seton is a painful and a nasty thing; besides which, it frequently wears through the skin before the end for which it was made can be accomplished." Issues made by incision, if they be large enough for the intended purpose, are apt to become inflamed, and to be very troublesome, before they come to suppuration; but openings made by caustic are not liable to any of these inconveniences, at least not so fre-

quently, nor in the same degree; they are neither so troublesome to make, nor to maintain. The cure depends greatly on the quantity of matter discharged; and, to increase this quantity, we ought to sprinkle the bottom of the sore with finely powdered cantharides, keeping open the issues until the cure is completed.

Mr Pott gives several very remarkable instances of cures performed by means of his issues; and other practitioners have likewise found the method successful, though it is probable that they have only been successful where the ligaments are affected, and not the bones, or these only in a very slight degree. Various machines have been contrived to remove the distortion, by forcing the body into its proper form after the spine has been put out of shape; but all of them do harm; the only one which can be of any service is the collar, represented Pl. 9. Fig. 1. for supporting the head and shoulders, which, by taking a considerable weight off from the trunk of the body, cannot but be of great service in the cure of this disease. Pl 9. Fig. 2. shews the figure of a collar for supporting the shoulder by itself.



## CHAP. XXI.

*DISTORTIONS OF THE LIMBS.*

THE bones of the limbs may be, and undoubtedly are, frequently distorted from the same cause which produces distortions of the spine, *viz.* an unhealthy, rickety, or scrophulous constitution. Sometimes they are distorted, merely by the contraction of the muscles; and very frequently they are naturally distorted by the feet, for instance, being either turned outward or inward. Mere weakness will sometimes occasion a distortion, as when a child is too soon put to walk, its legs will become crooked from inability to support the body.

Distortions of the limbs are much more easily cured than those of the spines. As they always appear in the time of infancy, when the bones are flexible, they can easily be brought into their proper shape by using machines, sometimes of a very simple kind; but, it must always be remembered, that, as the disease, in cases where the limbs are not naturally distorted from the birth, proceeds from weakness, we must not  
omit

omit to strengthen the system by all the corroborating medicines we can with safety make use of; for this will not only contribute very much to the cure, but to prevent a relapse. Sometimes a gentle and long continued pressure will be sufficient to make a bone straight; but generally some kind of machines, shoes, or boots, of a particular kind, have been found of great service. Pl. 9. Fig. 3. represents one of these invented by the late Mr Gavin Wilson of Edinburgh.

In those cases where the limbs are distorted, by reason of a contraction of the muscles, emollients are said to be of great use. Animal fats, and particularly Neat's foot oil, are highly recommended. The muscles and tendons, which are supposed to cause the disease, must be well rubbed, from their origin to their insertions, for half an hour or more, three times a-day, during which frequent endeavours must be made to extend the limb, but gradually, and without violence, and the rubbing and extension continued till the cure is completed. Emollients are likewise recommended in stiff joints, particularly the ankle, when there is no distortion.

## CHAP. XXII.

## OF INDOLENT TUMORS.

SOME of these arrive at a great size, in different parts of the body, without pain or inflammation; whence they have their name; though many of these, after having continued inactive for years, at last become seats of the most direful and malignant diseases. Others, again, are never any way troublesome, excepting by their bulk and weight, though they arrive at the weight of ten, twelve, fourteen, or even fifteen pounds, arising at first without any known cause, and gradually arriving at that astonishing magnitude. The tumors we treat of are of various kinds, and shall be considered in their order.

## SECTION I.

## OF ENCYSTED TUMORS.

§. I. *Steatoma.*

TUMORS of this kind, called also *wens*, have an elastic feel, and a considerable degree of mobility.

bility. When opened, they are found to contain a kind of fatty or suety substance; and it is observable, that they are always found in the cellular membrane, and particularly in those parts where the adipose matter is found to accumulate in the greatest quantity. I have met with many in the parietes of the abdomen, sometimes on the right side of the umbilicus, extending from the ribs to the top of the ilium, and occupying the whole umbilical region. I have also met with some on the opposite side, but none ever occupying the middle region. On the back, shoulders, and buttocks, they are also frequently found, and sometimes arrive at a great size, as well as on the fore and lateral parts of the trunk; for here the cellular membrane, of which the tumor seems to be a production, is thin in proportion to what it is in the other parts of the body. Sometimes they protrude considerably from the rest of the surface, and hang down by a narrow neck. The origin of tumors of this kind has not been explained in a satisfactory manner; but, to me, it appears probable that the cause is some rupture in the vessels appointed to absorb the adipose matter; by which means it accumulates in proportion to the secretion, and the number of absorbents destroyed. This rupture, or inability to absorb, however, seems to arise almost entirely from some internal cause; for,

fistomatous

Fig. 8.



Fig. 9



Fig. 4



Fig. 13



Fig. 2



Fig. 1



Fig. 12



Fig. 6

Fig. 13



Fig. 10



Fig. 5



Fig. 11



Fig. 7

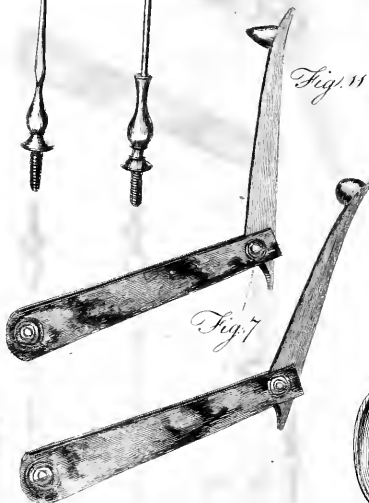




Fig. 7



Fig. 8



Fig. 9



Fig. 5

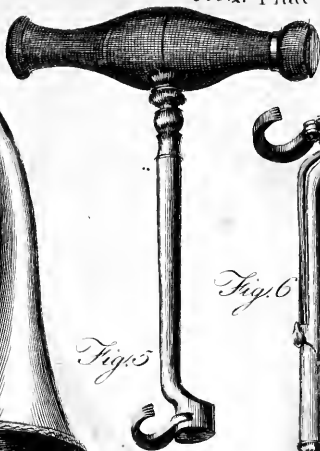


Fig. 6



Fig. 2



Fig. 3



Fig. 11



Fig. 4



Fig. 10







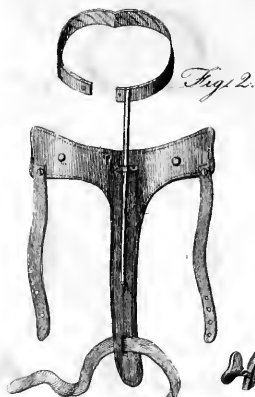


Fig. 4.

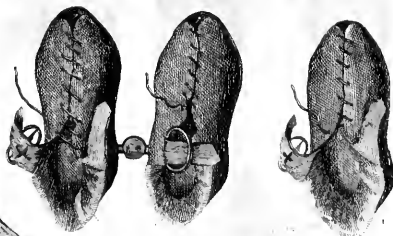
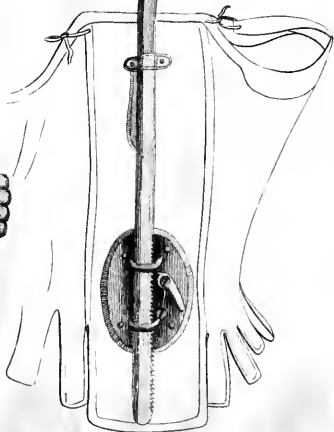


Fig. 3.





steatomatous tumors are never known to arise from external injuries, but always begin without the patient's knowledge, and increase insensibly, until they are discovered by their size. I think we cannot doubt of the absorption of the adipose matter, any more than its formation; and hence we must conclude, that steatomatous tumors are found in a manner similar to dropical ones in the scrotum, or in the ovarium.

§ 2. *Meliceris and Atheroma.*

THE meliceris is also an encysted tumour, but differing from the steatoma in the nature of its contents, which are clear and thick, resembling very pure honey. It is chiefly seated on the hairy scalp, as well as the atheroma, which contains a substance resembling pap, or a kind of poultice. Sometimes it has a quantity of cheesy like matter, mixed with a large proportion of fluid, considerably thicker than serum; and this seems to be a conjunction of the meliceratous and atheromatous tumors in one. Neither of these, as I have said, are commonly to be met with but on the head; however, I once met with a large oval tumor of the mixed kind, seated on the basis of the right scapula, and extending for a considerable way over the back. The  
contents

contents of this tumor consisted of a thick and cheesy part, mixed with a liquid considerably thinner than that usually found in meliceratous tumors. This substance was contained in different cells along the basis of the scapula, from whence it seemed evidently to have originated.

The three kinds of encysted tumors we have mentioned, differ from one another as to the consistence of substance they contain; but this cannot be accounted a proper method of distinguishing them before hand; for the contents of a steatoma are sometimes quite soft, and at others very hard. The part of the body on which they are situated affords, I believe, a better indication of the nature of the tumor. Steatomatous tumors are never met with on the head, though most of those of the wan kind are to be found here; but their contents are generally of the mixed kind; but, in any other part of the body, considerably elastic and large, which has continued to increase for years, I believe we may generally conclude it to be of the steatomatous kind, whether hard or soft. In all of these, however, that I have seen, either under my own care or that of others, did I ever see any of them, the contents of which fluctuated between my fingers like purulent matter, or had that appearance when the tumor was removed and opened.

All encysted tumors, when once begun, continue to increase very fast. Those of the athematous and meliceratous kind, as we have said, are found mostly on the hair scalp. They do not usually exceed the size of a common apple fastened to the head by a narrow neck; though in some instances they have weighed no less than eight pounds. None of the encysted tumors are attended with pain at first, though they are sometimes painful after they have attained to a great size. When this is the case, the veins on the surface immediately adjacent to the tumor become varicose; after which, the skin being so violently distended, begins to lose first its elasticity, and then its colour; acquiring such a redness as is consequent upon inflammation, though in the present case arising only from over distension. This distension, however, continuing to go on for a very long space of time, the skin will at last begin to fret, and by degrees to be dissolved entirely upon the most prominent part of the tumor, so that at last the contents are exposed to the air, and a very painful as well as dangerous ulcer ensues. As the skin of the head is thicker than that of the other parts of the body, the encysted tumors on this part seldom arrive at such a size as the others, and are proportionably less apt to burst. I have, however, seen many instances, in which the  
contents

contents of these tumors have made their way quite through the integuments, so that they discharged themselves, and the sore then healed by mild dressings, as well as any others. From the nature of the contents of encysted tumors, it is plain that no inflammation, but merely that of the skin, can take place in any of them; and of consequence no adhesion of the tumor to the adjacent parts can ever ensue; and in no steatomatous tumor do we ever observe any blood-vessel of consequence. These are only to be found in the parts adjacent; and hence, if the bag suffers by the inflammation of the surrounding parts, it is thrown out by suppuration, as an extraneous substance, and the sore heals in the common way. As these tumors seem to be formed by certain matters deposited in cells, and contained in a cyst, without any circulation through them, more than through the fluid contained in them; and hence, the only proper method of cure, is by extirpating them altogether, and dissecting away the sac which contains them; for, in other respects, they are equally incapable of resolution and of suppuration. When the matter is fluid, indeed, we may evacuate it by an opening with a lancet, or by means of a seton, as in a common abscess; but, as it is certain that in all of them there is a kind of caustic matter which adheres to the sac,

and

and as the fore will never heal while that remains, the preferable method seems to be, to remove the whole by the scalpel ; and this is easily done when the tumor is oval and flat, which is generally the case with the steatomatous ones. The teguments may be divided crucially ; but some caution is necessary to open the sac ; but as soon as the points of the skin are separated from the sac, there will be no danger of wounding the latter, providing we take care to turn the edge of the knife towards the skin at every stroke we make ; nay, as such tumors are only attached to the surrounding cellular substance, they may be separated almost as readily by the point of the spatula, without either pain, or the smallest danger of destroying the cyst. In very pendulous tumors of this kind, with a narrow neck in proportion to their size, we ought to divide the teguments, near the bottom of the tumor, in an oval manner, so that the wound may be covered with the two portions of the integuments, after the tumor is dissected away ; and though these integuments be even somewhat larger than the wound, they will make the cicatrix very complete.

After the tumor is removed, we must replace the skin over the wound, and fasten it with adhesive straps, as is directed in other cases, covering it up with a pledget of healing cerate, a  
small

small comprefs of linen, with a bandage above all, to make a gentle preffure on the parts. Every branch of an artery that happens to be divided muft be taken up, if we mean to heal the wound by the firft intention ; and indeed, wounds of this kind generally do heal at once, without either pain or inflammation ; but it is obvious that this can never be the cafe where the cyft is opened longitudinally, and left to nature to throw off. In fuch a cafe, we muft eafily fee that the wound has to go through a tedious courfe of fuppuration before the cure can be accomplished. Three weeks will be reckoned a speedy cure ; while, in the other way, it will not exceed ten days.

### § 3. *Cafes of Encyfted Tumors.*

Mrs S—, fixty years of age, had a very I.  
large fteatomatous tumor on the infide  
and back part of her right thigh, which had increased for fifteen years, but, during eighteen months, had augmented its bulk remarkably, and was now become fo large, that fhe could fcarce either fit or walk ; for which reafons fhe determined to have it removed. I began the operation, by laying the patient upon her face on a matrefs, placed upon a table, with the leg and  
I thigh



thigh stretched out. As the tumor had rather an oval than a narrow neck, I made a semi-circular incision on each side of it, at such a distance from the surface of the thigh, as enabled me to save a sufficient quantity of skin and cellular substance to cover the wound. I then removed the tumor very carefully, and completely; and, as no vessels were divided which could be taken up either with the tenaculum or needle, I brought the skin over the wound, and placed the edges of it in contact, securing them there by adhesive straps, covering up the wound with a pledget of cerate spread on linen, and laying over it several folds of linen. I had put a flannel roller round her body before she was placed on the table, and this I afterwards put round the top of her thigh; by which means the dressings were not only retained, but the skin firmly pressed upon so as to facilitate and hasten the union of the wound at its bottom. No medicine, nor even dressing, was required after the operation, as the wound healed in five days, and in other five she went to the country perfectly recovered. The tumor weighed ten pounds.

M. J. thirty years of age, had a large flat oval tumor of a considerable size and move- II.  
able, occupying the whole right side of the um-

bilical region ; the under part of which reached nearly to the symphysis of the pubes. She did not know how long it had been of forming, as it had never been observed until it had attained nearly its full size ; but she had often thought that there was a more than ordinary fulness on that side when she bent her body forward. I proposed instantly to take it off ; but to this she would not consent until six months after, when it had increased still more, so that she was at last glad to submit to the operation, which I performed in the following manner. Having stretched the patient upon a table of a proper height, and caused her hands to be secured by assistants, another assistant stretched the skin upwards and downwards as much as he could, while I made a longitudinal cut with a round edged scalpel through the skin and cellular membrane along the whole extent of the tumor ; after which, having freed its external surface from the skin, I raised up the upper end of it and dissected it away very quickly, and with very little pain. No vessels of any consequence were divided, so that there was no occasion for using the needle. After the wound was cleaned, I carefully replaced the skin, and retained the edges of it in contact by means of adhesive straps ; dressing it as above directed, and putting on above all a flannel roller. From the day of the operation, un-  
til

til the day that the cure was completed, there was not the least occasion for any medicine, excepting once a gentle dose of physic. The wound was healed in twelve days, with a cicatrix hardly perceptible. The tumor weighed four pounds six ounces.

A. W. aged forty-three, had, on the upper and back part of his head, a very large <sup>III.</sup> soft and pendulous tumor, in which could easily be discerned a fluctuating fluid mixed with some solid matters. It had been no less than twenty years in growing, and was so large that it hung down on the back of his neck and top of the shoulders; but though subject to much friction, the skin was not in the least discoloured, neither did any vessels appear in its surface; the neck also, by which it adhered, was slender in comparison with the bulk of it, measuring only four inches by two. I resolved therefore to take it off; and having seated the patient in a chair with a low back, and secured him by means of assistants, I divided the integuments semi-circularly, and dissected them away on each side to the very basis of the tumor, without opening the cyst at all, which I then dissected entirely away from the pericranium. In doing this a branch of the occipital artery was divided, but I immediately took it up with the tenaculum; after which  
the

the wound was cleaned, the edges of it brought into contact, and retained there by adhesive straps. It was then dressed with a pledget of softening ointment, a small linen compress, and a night cap over all. In five days the ligature came away from the artery, and every spot seemed to be united except the very one out at which the ligature had passed; and in five days more the whole was healed, with scarcely the vestige of a cicatrix. The tumor weighed six pounds, and contained a quantity of thin serous fluid, with a large proportion of solid cheesy matter.

## SECTION II.

### *OF GANGLIONS.*

THESE also may be accounted tumors of the encysted kind, being inclosed in the tendinous theca, particularly on the back of the hand; they are moveable, and their contents resemble the white of an egg. They are extremely elastic, and are never attended with any pain or inflammation; nor do they arrive at any great size, or ever discolour the skin. In a multitude of instances they go off insensibly as they came on, without

without any assistance from medicine or surgery; nevertheless, as they are disagreeable to the eye, and somewhat troublesome in other respects, means are used to remove them. Friction and gentle pressure with thin plates of tin or lead have been used with good effect. Neither of these, however, must be carried to any great length, lest they should produce inflammation, and cause a suppuration in the part, which is always to be avoided where membranes or tendinous substances are near. If neither of these remedies answer the purpose, the tumor may be removed with a scalpel from the tendon, to which it, for the most part, adheres very firmly. After the tumor is removed, the skin ought to be instantly replaced, and secured by a roller and compress; after which the sore will heal without any difficulty.

### SECTION III.

#### *OF SWELLINGS OF THE BURSAE MUCOSÆ.*

THE *bursæ mucosæ* are small sacs situated on the joint of the extremities, particularly the shoulder, elbow, and amongst the flexor tendons  
of

of the hands; the haunch, knee, and ankle joints, and alongst the flexor tendons of the toes. They are filled with a fine mucilaginous matter, resembling the synovia of the joints; and nature seems to have placed them near those joints where the friction is greatest, in order to lubricate them, and make their motions more easy than otherwise they would be; though we cannot determine how this is done. The fact, however, is, that as long as these joints remain quite healthy and sound, neither the fluid in the sacs, nor that contained in the cavities of the capsular ligament, is found to accumulate in any great degree. Hence we may reasonably suppose that the sacs, as well as the joints themselves, are well provided with absorbents. Whenever, therefore, we find any considerable swellings in the joints, particularly in the ligamentous parts, we may reasonably suppose that they are situated in the *bursæ mucosæ*.

Swellings of this kind are generally produced by rheumatism, sprains, or contusions of the joints, by which the parts are stimulated to pour forth a greater quantity of liquid than usual, and a certain degree of accumulation takes place. In general, these swellings are not attended with any pain, and thus they are not commonly discovered at first. In cases of sprains or contusions, however, after the pain and inflammation have

have been abated by the remedies already mentioned, when the burſæ mucoſæ happen to be affected, a ſmall circumscribed tumor remains, very elastic to the touch, but yielding to the pressure of the fingers. The seat of these tumors is uncertain; I once met with one immediately under the deltoid muscle of a strong man. It was very large, and seemingly extending itself under the whole of the muscle, and had been brought on by a fall which pitched him on the top of his shoulder. To me it appeared to arise from an affection of the burſæ, situated under the acromion and capsules of the humerus. In this case I felt a fluctuation when the arm was held on a right line with the body, and held in that position by an assistant, while I put one hand on the one side, and the other on the opposite side of the tumor. This tumor was perfectly cured by the use of blisters; whence, it appears to me, that all membranous sacs, as well as the peritonæum, are very delitable, and may be extended to a great degree without giving the patient any pain. Hence they may frequently surround the joint, as often happens in that of the knee, particularly after severe rheumatism. It is also not unusual, in cases of this kind, to find bodies of a cartilaginous nature differently sized and figured; many of them with small peduncles, though sometimes they  
are

are of a softer nature, so that they may easily be squeezed flat between the fingers. Bodies of a similar kind are likewise often found in the cavities of the joints ; but they are always easily discovered, by pressing your fingers pretty firmly down towards the bones of the joint, or by making the contents of the tumor pass quickly from one side to the other. It is not well known whether these bodies originate from the sac itself, or from its contents, in a manner similar to that in which stones are formed in the joints of arthritic patients. They cannot be removed by any remedy with which we are yet acquainted, either external or internal ; so that the only method by which we can get rid of them is the knife. In performing the operation, an assistant is to pull up the skin strongly, after having stretched out the limb, and laid it in the most proper posture. The surgeon, then, with a lancet or small scalpel, is to make a transverse cut in the skin, about half an inch long, at least if the tumor happens to be large. After this, we proceed to the sac, by scratching away the cellular membrane till the tumor be quite exposed. The point of a lancet is then to be introduced into the sac, and an opening made as large as that in the skin ; after which, the assistant must instantly press out the contents of the tumor, whether solid or fluid. This being

I

done,



done, we are to wash the inside of the sac with a mixture of seven pints of water and one of brandy, heated blood-warm. The injection is to be kept for about half a minute in the sac, and then gently squeezed out, the skin being afterwards firmly drawn over the wound, the whole secured by adhesive straps, and a thick compress of linen moistened in a solution of sugar of lead laid over the whole; the dressings being kept on by a roller tied sufficiently firm, not only to keep on the dressings, but to keep the sides of the sac in contact. Thus the sides of the sac will be united without any pain, in five days; if proper care has been taken to apply the sugar of lead properly by often renewing the cloths, and always applying the roller sufficiently tight. Some have recommended small setons, in order to produce an inflammation within the sac, by which the sides of it may be disposed to unite. But, if the seton be long kept in, a very high degree of inflammation, attended with severe pain, will be the consequence; and whenever this happens, the seton must instantly be removed; after which, the parts will grow together in a very short time; but still it is absolutely necessary to compress them; for, if this be not done, the inflammation will certainly end in suppuration, whatever method we take. Though swellings of the burſæ

mucosæ are not, for the most part, attended with any pain, yet it is otherwise when cartilaginous bodies are contained in the joints, for then the pain is often very severe, and comes on suddenly.

When swellings of the bursæ mucosæ happen to come on in consequence of rheumatism, they may generally be cured by the same remedies as the rheumatic white swellings; viz. topical bleeding, blistering, friction, and the application of saturnine solutions, giving the patient now and then a dose of some purgative medicine. But should they happen to prove obstinate, and resist these medicines, we must have recourse to the method already mentioned. In these, however, the assistant is not only to draw up the skin as far as possible, but the surgeon must thrust the point of the instrument at least a quarter of an inch obliquely below it, before he touches the tumor. As soon as its contents are evacuated, we must inject the warm water and brandy by means of an elastic bottle fitted with a proper tube, retaining the liquid in the sac for some little time, as already directed. Thus the wound will heal easily, without putting the patient to so much pain as he would be if we were to follow the directions of a modern writer on surgery, who recommends the laying open of the tumor, and dressing the sac from the bottom, until

til the wound granulate. I would not indeed advise the opening of a large tumid burſæ of long ſtanding, any more than I would advise the opening of the capſule of a joint. In many caſes I have cured my patient in four or five days, taking care, if the pain was very ſevere, to apply the ſolution of ſugar of lead affiduouſly until it was abated.

## SECTION. IV.

*OF COLLECTIONS WITHIN THE CAPSULAR LIGAMENTS.*

THESE may be of various kinds ; either ſynovial, partly purulent, ſerous or watery, or extravafed blood. They may be produced either by internal cauſes, or external injuries ; and, in general, we may know, from the appearance of the tumor, to which of the ſpecies juſt now enumerated it really belongs ; or, we may know, from the affection of the knee joint, whether the collection be purulent, ſerous, or bloody. When it ariſes from a ſevere ſprain, or contuſion of the joint, and the ſwelling within the capſule happen to appear immediately after, continuing to increaſe

crease for some time, we have every reason to suppose that the principal part of the contents must be blood. But, when it succeeds a violent sprain, attended at the time with violent pain, inflammation, and swelling, which at last terminate in an effusion, we have great reason to believe that the fluid contained in it is principally purulent, though mixed with a quantity of synovia; in which case the limb must be amputated as soon as possible, or the patient's life will be endangered. It is principally after severe rheumatic complaints that watery effusions take place; and, when the swelling of the knee is not very large, the fluctuation of the fluid within the capsule may easily be discerned, by pressing upon the swelling after the leg is extended, and the knee pan relaxed. By so doing the patella will be lifted up, and the capsular ligament of the joint is protruded below the under edge of it in such a manner, that it can be felt distinctly on each side of the ligament that ties the patella to the tibia. Collections of this sort are for the most part aqueous, and are to be cured by the means already laid down for a rheumatic *bursæ mucosæ*; such as bleeding, blistering, fomentations by vapour, and keeping the parts constantly moistened with solution of sugar of lead, keeping also the patient as loose as he can bear without inconvenience. But, when blood constitutes  
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the contents of the tumor, or principally so, we must use every effort to get it removed before any coagulation takes place, as after this it will be very difficult to do so. Having, therefore, stretched the leg, and pulled up the skin as far as possible, we must next make a transverse opening into the capsule sufficient to allow the fluid to be discharged, after which we must pull down the skin over the opening, and keep the parts in contact by means of adhesive straps. The limb must be kept very quiet for many days after the operation, and the whole joint covered with solution of sugar of lead. But, in cases of watery effusion, if we should ever be under the necessity of drawing off the liquid, it ought to be done by a very small lancet pointed trocar, introducing it in the same cautious manner as directed in the case of a large and tumid bursæ mucosæ. After the operation is performed, we must carefully draw the skin down over the wound, and prevent the air from getting in; laying also the limb in the most easy posture, and keeping it so, until there is no danger of inflammation or swelling taking place. If, however, any considerable degree of these should take place, we must endeavour to remove them by the remedies already mentioned under the head of inflammation. The following case will illustrate the propriety

priety of the manner of treatment just now recommended.

J. S. twenty-nine years of age, after recovering from a severe rheumatic fever, I. observed a fulness and swelling in his right knee-joint, particularly on the anterior part of it, on each side of the patella. At first it was attended with no other inconvenience than a slight fulness and tightness of the joint, when he stretched it out, but by degrees became more troublesome, and uneasy as it augmented in bulk, notwithstanding the use of every external remedy which could be thought of, such as strong volatile camphorated oil, solutions of sugar of lead, and other astringent liquids, as well as blisters, &c. At last it became very large, and a distinct fluctuation was felt on each side of the patella whenever the leg was stretched out, as well as behind the joint at the top of the leg. His health being greatly impaired, both by the preceding fever, and the uneasiness given him by the tumor itself, he became extremely desirous of having it removed. Having tried in vain every external as well as internal remedy, I, with two other practitioners, proposed to let out the fluid, which appeared to be wholly contained within the capsular ligament. We took care, however, to inform him of the danger he was in of extreme pain

pain and uneasiness from laying open the cavity of the joint ; nay, that there was even a possibility of his being at last obliged to submit to an amputation of the limb in order to save his life. He was not, however, intimidated by this intelligence, so that, the operation being resolved on, I performed it in the following manner. Having stretched out the limb as much as possible, I divided the skin, for about half an inch, in a transverse direction, a little below the joint. I then introduced a very small lancet pointed trocar, pushing it up at least half an inch or more between the skin and the capsule. After this I penetrated the capsular ligament itself. On withdrawing the trocar, the matter was discharged very freely to the very last drop, after which the canula itself was withdrawn, the finger being kept upon its orifice during the time, to keep the air from getting in, and the skin kept down with a finger of the other hand, so as to form a kind of valve, by which the air was effectually excluded afterwards. The wound was dressed with a pledget of caddice well moistened with Wade's balsam, it sides having been previously drawn together, and the dressing laid over it in several folds. The limb was then laid perfectly straight, and covered with cloths dipped in solution of sugar of lead, in an equal quantity of vinegar, spirits, and water ; half an ounce

ounce of the salt, and four ounces of each of the liquids. The cloths were kept constantly applied, and he was not allowed to move his limb; but, on the third day, he began to complain of pain in the joint, not very great indeed, but, as he thought, gradually increasing. I examined the limb, and found no swelling; but, as he was greatly alarmed on account of the pain, I applied a blister on each side of the knee, and gave him an injection, by which he was greatly relieved; and by the use of another blister, and two doses of the compound powder of jalap, the pain was entirely removed, while the joint continued motionless, which it did for ten days. I then moved it with my hand, and allowed him to do so while in bed, which he did with very little pain. When the second blister was healed I caused him rub the joint with camphorated volatile liniment, and in six weeks from the evacuation of the serum, which measured twelve ounces, he had not only recovered his strength, but the entire use of his limb, and has continued well ever since, now a space of six years.

SECT.



## SECTION V.

*OF CARTILAGINOUS BODIES WITHIN THE CAVITY  
OF THE JOINT.*

THESE have in some measure been treated of already. They adhere to the cartilages of the joint, and several of them have been discovered in one joint, and they generally keep their place exactly without variation, or shifting only very little. It has not been yet discovered by what means they are formed. In four cases that I have seen of them the patients were men of a strong constitution, and employed in very laborious business, which exposed them to wet and cold, especially in their limbs, and all of them had been subject to rheumatic pains, and had once a very severe rheumatic fever. In two cases, after some slight symptoms of rheumatism, they were attacked at once with a most acute pain, insomuch that they were almost ready to drop down. The origin of this pain seemed to them to be something suddenly thrust in between the bones of the joint, and by sitting down and gently moving the joint, they felt, as they thought, some hard body shift its place; and after this

the pain immediately abated ; so that they could walk without any inconvenience. On feeling the joint slightly nothing was discovered ; but continuing this daily, they at last felt something hard and moveable within the cavity of the joint, on the inside of the patella, in the hollow of the joint. On rubbing the part, and pressing on the substance, it slipped in between the ends of the bones, producing almost an intolerable pain ; nor did they obtain relief a second time in less than three or four hours. In the other two cases the patients accidentally discovered the hard bodies by rubbing the fore part of the joint on going to bed ; but in these two, the bodies were much more fixed than in the others, appearing also larger ; but without any difference in the pain occasioned by them when they happened to get in between the bones, at which time it was always most severe.

The only thing that can be attempted with a view to cure in these cases, is to remove the bodies by a knife ; but, as this cannot be done without opening the capsule of the joint, there is great reason to expect a violent injury ; which has often been known to ensue from the violent inflammation, swelling, &c. that is produced by the admission of air, and that these arise to such an height as would destroy the patient, unless the limb were amputated. It is certain, however, that many such bodies have been cut out without

out any inconvenience to the patient; and, I think, that we ought always to propose to cut them out, rather than think of amputation. In all the four cases above mentioned, I succeeded perfectly in removing the cartilaginous bodies, and making a complete cure. The method I took was very simple. Having placed the patient on a table, and brought the substance to the outer edge of the joint, fixing it as it were between the bones and capsule, now rendered firm by bringing them into a straight position, I made the assistant pull up the skin as much as possible on the fore part of the joint, and then made my transverse incision, at least three quarters of an inch below the place where I meant to divide the capsular ligament. Having then dissected away the skin in a straight line with the upper end of the cartilage, my assistant retained it in this position with two blunt pointed hooks, while I endeavoured to secure the cartilage firmly with the left hand, and at the same time pressed the under part of the ligament so close to the joint, that no air could get into the cavity. I then made an incision through the capsular, ligament upon the cartilaginous body, along its whole length, and pushed it out at the wound of the ligament, by turning it forwards with the wooden end of the scalpel, pressing it upwards at the same time with the fingers of my left hand.

Thus

Thus the air was effectually kept out ; and, as soon as the cartilage was removed, before I took off the pressure which excluded the air, the skin was brought down over the wound in the capsular ligament, and kept fast in the place by adhesive straps. After the operation was over, I took care to keep out the air, by drawing the cut edges of the skin together, and keeping them together by adhesive straps. The limb was kept exactly in the posture in which it was laid, the parts were dressed with a pledget of Gowlard's cerate over the wound ; and, the more effectually to prevent the limb from being moved, it was fastened down to the bed by means of straps put across the thigh, so that, not even during sleep, was it possible for him to move it from its place. The wound was healed in five days, and in none of the patients has there ever been any symptom of relapse. In all of these, however, the cartilaginous body was quite loose, without any adhesion whatever to the joint ; but when it is otherwise, I would not be in a hurry to advise the cutting of the ligament ; because, in that case, it is very evident that the air could not be excluded from the cavity of the joint. Two cases of this kind I have seen, in which the patients suffered very severely ; one of them at last losing his life, and the other his limb. Where the cartilaginous body  
is

is quite moveable, we may also make the incision in the capsule so high, that not a particle of the synovia can ever escape; and, by keeping the limb in a straight posture, it must fall rather to the back part of the joint than to the sides or fore-part of it.

## SECTION VII.

*OF ANASARCA, OR OEDEMA.*

THESE are watery swellings in the cellular substance. They are cold, colourless, inelastic, and always retaining for some time the mark of the finger when pressed upon them. They may be produced by various causes, but are often occasioned by some general disorder in the system, though they may also arise from local disorders. Thus we see, that after violent sprains of the wrist or ankle joints, the hands and feet will swell and become œdematous, which will likewise happen when the lymphatic or red veins are compressed by tumors, as in the last months of pregnancy, when the limbs and feet swell and become œdematous. In this section, however, we mean only to treat of those swellings  
that

that take place in the limbs and feet, or in the scrotum and penis, as the effects of dropfy. Even in these we can only give a temporary relief if the tumors are large, by making a number of small punctures through the skin into the cellular substance; and in many instances there is a surprising relief given in this way. Two cases of this kind fell under my inspection, in which the anasarca of the legs and thighs was not only very great, as well as in the trunk of the body, but accompanied with a high degree of ascites; neither could the smallest good effect be perceived from any diuretic that could be exhibited. But, on making several small punctures in each leg, all the water, not only in the legs and thighs, was drawn off, and a radical cure was affected, both of ascites and anasarca, by the use of half a drachm of the crystals of tartar four times a-day, which operated as a very strong diuretic. We are, by no means, however, in cases of this kind, always to expect a complete cure; on the contrary, it is only a temporary relief that for the most part can be obtained. It must likewise be carefully attended to, that, in bodies subject to anasarca or œdema, a violent inflammation, or even gangrene, is very apt to ensue after incisions; and, therefore, we must by no means make large incisions, but only small punctures

punctures with the point of a lancet through the skin into the cellular substance.

## SECTION VIII.

### *OF THE NÆVI MATERNI.*

THERE are two kinds of these, viz. small red tumors, which gradually increase to a large size; or, they are only brown and flat marks not rising in the least above the surface of the skin. I met with one instance in a child of two years old, which had a tumor of this kind weighing fourteen ounces, which at the time of birth appeared only of the size of a large bean, and continued for a year without much augmentation of size; but, after this time, had grown to the size already mentioned. Other tumors of this kind which rise but little above the skin, are of various forms, and have been compared to cherries, grapes, &c. and have all been supposed to arise from some impression made on the mind of the mother during pregnancy, or at the time of conception; and, to the same cause are likewise attributed all the deviations from the natural form of the foetus, as, when it is  
born

born without a hand, club-footed, or otherwise deformed. To this, however, it may be replied, that, if the minds of women at that time were so active and powerful, there is a possibility they might, instead of merely depriving the foetus of a hand, or any small portion of the body, deprive it of existence altogether. But, it is evident, from the great number of illegitimate children daily brought into the world, that the minds of women possess no such power, and consequently we cannot with reason ascribe to them the power of forming tumors or marks of any kind. On the other hand, it may be replied, that every violent affection of the mind in a pregnant woman, especially if suddenly brought on, will affect the foetus to such a degree, as to deprive it of its existence; *i. e.* it will cause an abortion; and, if it can do this, it may certainly be productive of any lesser injury. It is not, however, merely affections of the *mind* in the mother that produce such defects or diseases in the infant. There are undeniable facts which prove the existence of a sympathy between any part of the body of the mother and the corresponding part of the body of the foetus in utero. And why should we think this extraordinary, since there is an undeniable, though unaccountable sympathy between all parts of the human body and the foetus, during the time it is in the womb,



womb, may with great propriety be said to be a part of the mother's body. Hence, say the advocates for this doctrine, any thing thrown at a pregnant woman with such force as to give a sudden surprise and shock to the mother throughout her whole frame, will affect the child in the part corresponding to that in which she received the blow. It is, however, foreign to our purpose to enter into this dispute; I shall therefore proceed to give some account of the structure of these tumors, and the method of removing them.

There can be no doubt that tumors of this kind arise from some general affection of the part, as in the harelip, where a portion of the substance either of the lip or jaw is deficient; but such tumors as are of a dark livid colour, we will generally find to have arisen from a dilatation of the veins, or of the small arteries opening directly into the veins, by which a varicose tumor is formed, and which generally increases with the growth of the child for some considerable time. We find that *lufus naturæ* take place in every part of the body as well as on the surface. All the flat and discoloured tumors on the surface, whatever be their shape, are soft and compressible, and in some cases will instantly disappear, when the artery that supplies them with blood is stopped, leaving nothing behind them

but flaccidity in the part, and a bluish colour. Sometimes indeed, though rarely, such tumors acquire a considerable size. I have met with some instances where tumors of a livid colour have arisen in the frontal veins; but which, upon being examined, was found to be nothing else but a *lufus naturæ* in their formation, by which they were rendered in a great measure unfit for performing their office, and of course easily dilated. In another case, I found a large oval tumor on the lesser canthus of the right eye. At the time of birth it had only been a bluish spot entirely on a level with the rest of the skin; but, as the child increased in size, the tumor likewise increased, until at last, when the child was three years of age, the swelling suddenly burst during a fit of coughing, and bled profusely. I was sent for at the time, and stopped the hæmorrhage, by applying a firm compress kept on by a roller. But, as this was only a temporary relief, I proposed to lay open the tumor, and take up the artery which seemed to pour its blood directly into an open vein. This being agreed to, I placed the patient on a table in a proper light, making my assistant compress the temporal artery with his fingers. The tumor was then laid open to the bottom, when we discovered that the anterior large branch of the temporal artery, situated on the outside of the canthus, opened into a vein that runs over the  
cheek-

cheek-bone ; and, by its dividing this, as well as all the small branches connected with it, the tumor had been formed. Having opened all the parts, so that I could discover the open end of the artery, and tying it with the tenaculum, the hæmorrhagy was entirely stopped ; after which, the edges of the small cut were brought together, and kept in that position until they healed. It is only in tumors of this kind, however, where the affection proceeds from a varicose affection, or where it is of the round hard kind already mentioned that an operation is required. In the latter case, we ought always to remove them as early as possible, the proper method is by cutting the skin in such a manner as to save a sufficient portion of it to cover the fore, and securing the hæmorrhagy as already directed ; after which, the wound will heal by the first intention.

## SECTION IX.

### *OF WARTS.*

THESE are hard transparent tumors, with a rough surface, generally appearing on the hands and face in the time of childhood or youth. Sometimes, however, they appear late in life, and then they

they frequently do not terminate favourably, but are apt to degenerate into cancers, especially when of a livid colour, and with a smooth surface. But, in young people, the warts we so frequently meet with fall off of themselves, without leaving any vestige of them behind; for which reason, unless they happen to be very large, or situated in such a manner as to impede the motion of the fingers, they ought not to be meddled with. In warts, however, which are pendulous, which is generally the case with those on the face, eyelids, or lips, they may be easily taken off, by tying a waxed silk thread firmly round their neck; or, where the basis is broad, we may take them off by means of a long small pin, the point of which must be inserted into the centre of the wart, and until it give a little pain. Thus the pin will easily stick in the wart of itself; after which, if the patient has fortitude enough, he is to hold the end of the pin in the flame of a candle, until the water which exsudes from the wart appears to boil. The pin must then be removed, and a small folded cloth, dipped in vinegar, put over the wart, when it will instantly shrivel and decay, and in a short time disappear entirely without ever returning. In this way I have seen many warts removed; and, except for a moment, the pain is trifling, none being ever felt after the pin is taken away.

In

In some hard superficial warts, particularly such as are situated on the joints of the fingers, after having moistened the tumor well with warm water, and brushed the surface of it with a fine tooth brush, take a fresh and strong flavoured onion, and cut it across, until some of the juice appear; then having dried the surface of the wart perfectly, rub it morning and evening with the onion juice, softening it as before with the warm water, and rubbing it well with the brush. By persevering a few days in the use of this remedy, the wart will disappear, and not return any more on the same spot.

Thus I have known many warts removed without the application of either caustic, astringent, or acid of any kind; but, if such remedies should be found necessary, it will still be proper, before we apply them, to soften the hard and crusty top of the wart in the manner directed, that it may become porous, and readily absorb the liquid afterwards applied to it. If some caustic is now dissolved in water, and applied to the centre of the wart, by means of the end of a probe, it will spread not only all over the top of it, but likewise on every part of the surface and the adjacent skin, and in hard warts will affect it at once to the very bottom, and destroy it very quickly. We must however, observe, that, in cases where the caustic is applied to the  
hardened

hardened and dry surface of the wart, not only the wart itself, but the adjacent skin becomes painful and inflamed. Before the caustic is applied a second time, therefore, we ought to moisten the surface of it well, as already directed. We must also remember that the caustic solution is to be applied to the very centre of the top of the wart, either by means of the point of a probe, or a pretty sharp wooden point, pushing the instrument a little down into the wart, that the liquid may not spread over the whole surface, or be rubbed off, and thus the efficacy of this remedy in destroying them will soon be perceived.

Besides those warts already mentioned, however, there are others, the consequence of the venereal disease, which generally attack the penis, and will sometimes even remain after the patient has undergone a full course of mercury, and all possible methods have been used to keep them clean by washing with warm lime water; solution of sugar of lead; decoctions of oak bark, in every eight ounces of which one drachm of alum has been dissolved. When all this has been done, and the warts become pendulous with narrow necks, we have then nothing to do but remove them at once with a pair of fine scissars. In this way I have removed, I dare say, ten thousand of them without the least inconvenience to the patient, and by continuing the decoction

decoction of oak bark with alum, neither hæmorrhage nor inflammation ever ensued ; and in no wart that ever I saw effecting young people, nor in those of a venereal nature, was the scalpel necessary. A ligature, applications to the centre of a broad wart, or at any rate the scissars, will remove it with ease.

Cancerous warts frequently require a different mode of treatment from that above recommended ; but were we to treat them exactly in the manner just now directed as soon as they are perceived to increase, I believe that very few of them in comparison would become cancerous ; especially if they had not become red or inflamed about the roots ; for then the cancer is in some degree begun. Arsenic has been recommended as an application to cancerous warts ; but, as it seems to act in no other way than merely as a caustic, why may not any other caustic be equally serviceable ? I had an instance of its efficacy in the case of an old lady who had a cancerous wart on the top of her right cheek, on the under and inner edge of the cheek-bone, near the side of the nose. This had been removed by an eminent surgeon in town about eleven years before I saw her. In a short time, however, it returned and increased in size ; another also made its appearance on the side of the nose, on the under end of the nasal bone, which likewise increased

creased considerably. At this time both appeared remarkably red, and about the size of a large strawberry, half an inch at least in diameter, and of a proportionable height. Nothing had been done after the first operation, but to dress them with simple cerate. Having accurately examined both these excrescences, I observed that they were soft and spongy on the top, and emitted a small quantity of purulent matter. I therefore touched the one on the cheek with a little nitrous acid diluted with an equal quantity of water. It was applied by dipping the point of a small wooden probe in the liquor, and thrusting it into the very centre of the tumor, and continued to do this every day; covering the tumor with the liniment afterwards. By degrees the tumor lost its red colour, decreased in size, and, in three weeks, was thrown off entirely from the cheek, leaving only a very small superficial ulcer, which healed completely in a few days by continuing the liniment as usual. In this tumor the application of the acid liquor produced only a slight pain at first, which soon went off; but with that on the nose it was otherwise. In this the application occasioned such extreme pain, that I was obliged to wash it off with an hair pencil immediately after it had been put on. On dressing it with simple cerate, however, the pain instantly abated, by which I was encouraged



raged to renew the application next day ; but the pain being equally violent, I was obliged to wash it off as before. In this manner, however, I persevered for five days ; when both of us were sensible of a diminution of size in the tumor, as well as an abatement of its red colour. This made the lady, as well as myself, resolve to continue the same method ; and in sixteen days from the first application, the tumor entirely dropped off from the nose, as the other had done from the cheek. A small superficial ulcer remained, which healed at most in ten days after the tumor dropped off, and she has now remained well for as many years, without any mark remaining at all discernable, unless upon narrow inspection, and being told the fact.

## SECTION X.

*OF CANCEROUS BREASTS.*

**T**HOUGH cancers, as has been mentioned in a former part of this work, are liable to affect various parts of the body, both externally and internally, from different causes, yet they are found more frequently in the breasts and uterus of

females, than in any other parts ; though I have never met with an instance of both uterus and mammæ being affected at once. I am indeed of opinion, that true cancers in the breasts of women never take place until nearly about the time of the cessation of the menses ; and I am persuaded, that almost all the tumors that have been cut out of the female mammæ, from the age of twenty-two to thirty-six were only of a scrophulous nature. I have seen several instances of this kind ; and in two where the patients had been advised to lose their breasts, I effected a cure in a few weeks by gentle mercurial friction, which, however, was never carried as far as to affect the mouth. But, when from every symptom we have reason to believe that the cancer is confirmed, we ought without delay to advise the patient to submit to the operation, especially as in all probability the disease may be only local, and a radical cure may be of course expected ; and this the more especially if the glands of the axilla are not swelled and hardened. It is always to be observed, that the sooner the operation is performed, so much the better ; for, if through the negligence or timidity, either of the surgeon or patient, we allow the gland to inflame and ulcerate, there is much less probability of a cure being effected by amputation than in the former case. The same bad consequence is also to be dreaded when  
the

the gland adheres to the pectoral muscle, and when the skin adheres to the tumor. It is also a bad sign when there are large glands in the armpit, and on the fore and under part of the clavicle, for these show that the cancerous virus is not now confined to one place, but has begun to pervade the constitution. It is still worse when the ulcerations have been of long standing, have become deep, and a considerable portion of the breast has been destroyed; and particularly if the arm on the same side is become œdematous, and the pain of the ulcer has become very great. When matters have proceeded such a length, and the patient's health is much injured by the pain, want of rest, &c. no surgeon of any candour or humanity would propose an operation, for the following obvious reasons.

1. The patient's health and strength being already much impaired by the long continuance of the disease, she must undoubtedly be very little able to bear the additional pain and weakness of one of the most formidable operations which can be performed on the human body. That the amputation of a cancerous breast is a very terrible operation, even when performed in the very best manner, cannot be denied; how much worse then must it be when an hour, or perhaps more, is taken up with it, instead of twenty minutes, which ought only to be employed.

2. Though

Though we should even suppose this objection to be got over, yet the danger arising from an absorption of the cancerous virus is so great, or rather so inevitably certain, that we cannot have the smallest hope of preventing the disease from returning. We may therefore conclude, that in all schirrous cases, where the tumor has been evidently proved to be degenerating into a cancerous nature, we are to amputate immediately; or, even though ulcerated, particularly if it appear to be loose and unconnected with the neighbouring parts, the operation may be performed with a considerable probability of success; but where the distemper has been of long standing, and the patient's strength greatly exhausted, we can do nothing but prescribe some palliative to alleviate the pain in some measure.

In performing this operation, as well as any other, we must remember to save as much skin as possible; and none must be removed or cut on any account, excepting what is absolutely necessary to admit the incision of the gland, or such as is evidently diseased. We know when the skin is diseased, by its being discoloured, and when, upon examining it carefully with the fingers, small hard knots or glands are felt in it though they cannot be seen, as much as is in this situation must be removed along with the gland. The patient must be laid on her  
bed,

bed, on the fore-part of which, the surgeon is also to sit while he performs the operation ; or, if the bed is inconvenient, she must be laid on a table covered with a mattress. If the gland is perfectly loose and unconnected with the surrounding parts, an incision must be made from above, downwards, through the skin and cellular substance, throughout the whole extent of the breast ; but we must by all means endeavour to save the nipple, by making our incision a little to one side of it. After this, the skin and cellular substance must be dissected away from each side of the mamma, until they be fully separated on the fore-part. The surgeon next begins at the upper part of the breast, carefully separating the whole of the mamma from the pectoral muscle, which he must take care not to injure. Thus, having completely separated the skin from the mamma, and the latter from the subjacent muscle, the wound must be well cleaned with a warm moist sponge, and the blood-vessels taken up with the greatest care by the tenaculum ; after which, the skin and cellular substance are to be closely applied to the muscles and ribs, uniting the sides of the wound by the twisted suture. A large pledget of simple cerate is now to be put over the sore, and over that several folds of linen ; the whole being kept on by a large flannel roller and scapulary.

Great

Great care must be taken to remove all the diseased part of the gland, and every other which seems to be in the least affected; a practice I am afraid too little attended to by the generality of surgeons.

Thus the operation is to be performed when the skin is whole, and no kind of ulceration has yet taken place; but, when the skin is also diseased, and adhering to the tumor, we must include all the diseased parts in one oval, and remove the whole along with the gland. The vessels are to be taken up as already directed, and the sides of the wound brought together by means of the twisted, or some other suture, as already mentioned. If there are any diseased glands in the axilla which do not appear to have any connection with the mamma, we must make an incision directly over them, (after having dressed the former wound in such a manner as to prevent the ingress of air), and then separate them from the surrounding parts by the scalpel. In removing these glands, we will find it very convenient to use a dissecting hook or needle, in order to raise and hold them. When they lie deep in the axilla, we must be extremely cautious in using the knife, for fear of wounding the artery, as this would be attended by instant death, unless stopped by the finger as it passes over the first rib; and, even though this

was

was done, the arm would be unavoidably lost. After having removed all the glands which have any appearance of being diseased, we are to bring the sides of the wounds into contact by the twisted, or some other suture, so that they may heal by the first intention. The dressings must be the same as those already directed for the breast.

On the whole, we may observe, that this operation is little other than a neat dissection, as it were on a dead body. The pain must therefore at any rate be extreme; but, much of the success of the cure depends on putting the patient to as little pain as possible. Where an unskilful operator has unhappily protracted the operation to three or four times its proper length, the patients never recover any great degree of health, although the operation succeeds well; but, generally in about a year or more, they become languid, dyspeptic, lose their appetite, and at last die emaciated, or seemingly from inanition, the *vis insita* being apparently totally destroyed. Such I am persuaded we would find to be the case, were accurate histories given of those who suffered long under the hands of the operator in the incision of cancerous tumors.

## SECTION XI.

*OF FLESHY EXCRESCENCES.*

THESE seem to be of the nature of warts, only that they are produced from both cellular substance and skin, while the warts are productions of the skin only. They are also softer and smoother than warts, resembling a cherry in colour, but sometimes growing to a very large size. They are not troublesome, except from their size, but cannot by any means be discolled or removed, except by the knife or ligature. Such as are pendulous, with a small neck, are easily taken off, by tying a ligature around the neck as soon as the tumor begins to increase rapidly in size; but, where the neck happens to be too broad for a ligature, we must have recourse to the scalpel, and save as much of the skin as possible, in order to make the wound heal by the first intention. We must be extremely careful in removing <sup>not to leave</sup> the least particle of the tumor; for, if any of it is left, we will not be able to prevent it from increasing again to a greater size than before, the surface will be broader



broader, and the whole tumor more fixed and difficult to be removed by a second operation. If by bad management it be suffered to recur a third time, the case will still be worse, and the vessels may be so excessively enlarged, and become so numerous, as to threaten the destruction of the patient by an hæmorrhage, if we attempt a second operation ; which, after all, will prove ineffectual, unless the same care be taken which ought to have been done at first, and which, had it been taken, would have prevented any farther trouble.

## SECTION XII.

*OF SIMPLE EXOSTOSIS, AND OF VENEREAL EXCOSTOSES, OR NODES.*

UNDER the head of exostosis, we must include the spina ventosa and rickets ; for a full account of which I must refer the reader to the first volume of this work. The true exostosis may be either a simple bony tumor arising from the surface of a hard cylindrical bone, or an enlargement of the bone itself, particularly near the joints where the substance is thin. They gene-

rally appear on the lower limbs, on the tibia, particularly near the ankle joint, on the internal part of that bone. In some I have felt the surface of the tumor quite rough, irregular, and scabious, at the same time that the skin which covered the exostosis appeared perfectly sound, and of its natural colour. In most of the cases which I have seen, the children were born with the tumors, but the latter acquired a larger size afterwards, though I never observed any of them bigger than a Turkey egg, the top rather spreading out, and the basis narrow, in proportion to the size of the tumor. None of them were in the least painful; and we know from these which arise after fractures from a flux of matter, that it is not their nature to be so. After having arrived at a certain size, these tumors also seem to become stationary; they seem likewise to be composed of the same matter with the bone itself; and, when examined, they are found to consist of a number of cancelli, their surface being always equally hard with the bone itself.

When an exostosis arises to any great size, it ought to be removed, as sometimes they have been found to lose their hardness, and likewise to soften the adjacent bone. The best method of doing this is to make a semilunar incision on the side of the tumor, of such a distance from its  
root,

root, as to save as much of the skin and cellular substance as is sufficient to cover half the wound. A similar incision is to be made on the other side; after which, the two portions of integuments should be freely dissected from the bone and its root, so that we can allow a small fine-toothed saw to be applied to the root of the tumor, exactly on a level with the surface of the bone. The neck of the tumor being thus divided close to the bone; after which, the teguments are to be brought completely over the surface of the divided bone, and united as in other cases where tumors have been dissected away. A pledget of simple ointment is to be put upon the wound, with a compress over it, and a flannel roller over all. If any pain or swelling should afterwards take place in the wound, they must be removed by the remedies directed under the head of inflammation. I have operated upon three patients labouring under exostosis of this kind, all of whom were cured in a fortnight, and have not had the least return of the disease since the operation. It is three years since the last of these patients was cured.

Of a much more dangerous kind are the swellings called gummata tophi, and nodes, arising from a venereal cause. These are the last effects of the disease upon the system, and show that the whole body is thoroughly infected with

with the poison. This will certainly happen when either a gonorrhœa or chancres have been improperly treated, and the disease has not been eradicated by mercury. In such cases, the patient may for some time appear to be well, but at last will be attacked by languor, wandering pains through his body, restlessness, great loss of strength, and loss of appetite. These symptoms are attended with a pulse quicker than usual, a pale, meagre, and yellow countenance; after which, cutaneous eruptions begin to make their appearance. Sometimes these fall off in white scales, and appear to heal, but always break out again, and at last degenerate into permanent foul ulcers having the appearance of an honey comb, with livid edges, destroying the cellular substance below the skin; and, on the surface of the muscles, leaving the superincumbent skin livid and flaccid, but still covering the sinus or ulcer. Then follow ulcers of the palate, tonsils, and mouth, which continue to increase, until they, in a short time, destroy the soft parts entirely. After these terrible symptoms have tormented the patient for some time, the pains begin to be more fixed and constant, increasing greatly in bed, and occupying particular places. They now soon show themselves by gummata, or tumors on the aponeurosis of the tendons in different parts of the body, as on the fore arm near  
the

the wrist, the leg near the joint of the ankle, and frequently on the anterior part of the knee. Often they contain matter, and then the flesh of the thighs and other parts of the body, on which they are situated, appears of a livid colour. When the tumors break, the sores emit a very fetid sanies, and appear foul and yellow at the bottom. These tumors and ulcers are quickly followed by hard swellings on the long cylindrical bones, and sometimes on the flat bones also, attended with great pain, so that the head, sternum, ribs, &c. as well as the extremities, are liable to be attacked by them.

From this history of the disease, it appears, that, in the venereal disease, the softer parts of the body are first attacked, then the aponeuroses, or those of a somewhat harder consistence, and last of all the bones; and, if the disease is left to nature, exostosis will make their appearance from six to twelve months after the first appearance of the symptoms of infection. It may, however, happen that exostosis alone will appear, and that at a very long distance of time from that at which the infection which occasioned them was received. In all cases, therefore, when a patient complains of violent pains in the tibia or thigh-bones, or bones of the head, greatly exasperated when warm in bed, we may conclude that they are occasioned by a remnant of the venereal disease, though

though perhaps he has had no symptom of it for several years before. This can only arise from an insufficient quantity of mercury having been formerly used; and, from the history of the disease already given, it must evidently appear, that, as the bones resist the infection more than the soft parts, so must they, when once infected, also resist the remedies, by which the disease is to be expelled, more powerfully than the soft parts; and consequently, though a quantity of mercury may have been exhibited sufficient to expel the infection from the soft parts, yet it may still lurk in the bones, and that for some time, longer or shorter, according to the quantity or virulence of the poison. It ought, therefore, to be a maxim with all surgeons, after they have removed every symptom of infection from the fleshy and membranous parts, to persevere in the use of the medicine for some time longer, as fourteen or twenty days, until we have every reason to believe that none of the infection is lodged in the bones.

The venereal exostosis, being of a nature entirely different from that already described, must be cured by the same remedy that we would cure a venereal ulcer or other symptom in the soft parts, and this is no other than mercury. The patient must be confined to his room, and two drachms of an ointment composed of equal parts

parts of quicksilver and lard properly triturated is to be rubbed forcibly each night into the extremities. If it does not soon begin to show its effects, the quantity must be augmented; but, as soon as it has shown manifest signs of having saturated the system, we must keep it up to that point only, without producing salivation, until every symptom of tumor, hardness, and pain, has disappeared. But, for the reasons already given, we must not stop here; the mercury must be continued for at least fourteen days after they are all gone; and, though we cannot consider opium as a cure for the venereal distemper, yet, from repeated experience, I have found it very advantageous, not only as alleviating the excessive pains to which patients in this disease are subject, but likewise in preventing the medicine from running off by the bowels, which it is very apt to do, and of keeping upon the surface of the skin a constant perspiration. How ready venereal symptoms are to recur, when a proper quantity of mercury has not been used, will appear from the following instance.

I was consulted by a lady who had been infected by her husband five years before, during which space she had used mercury no less than four times. The first symptoms were a chancre and swelling in the groin, which being removed, she was supposed to be cured. But, two months after, a sore throat manifested the insufficiency

sufficiency of the cure. This being also removed, she continued well for nine months; after which, she was seized with violent pains in her head, thighs, legs, and arms; and these were quickly followed by ulcers in different parts of the body, the teguments around them being of a livid colour, and very flabby. By the use of mercury all these ulcers were at last healed up, but still the disease was not eradicated. After having been, to appearance, nearly well for twelve months, fixed pains began to come on in the os frontis, parietal bones, the middle of the left tibia, right humerus, and a large swelling of the left fore-arm, where a large exostosis appeared, and ulcers similar to those which had formerly been healed, made their appearance on the opposite leg and thigh. On being called, I found her even quite ignorant of the nature of her disease, she was greatly emaciated, and suffered excessively from the pains. I instantly put her upon a mercurial course, beginning with ten grains of the common mercurial pill at night, and as much in the morning; and when the system appeared to be charged with the medicine, as the pains still continued to be very excruciating, and her belly became lax, I joined with the mercury two grains of opium at night, and as much in the morning. Thus her pains were in some measure alleviated, and the cure went on as rapidly as could be expected in  
such



such desperate circumstances. The sores were dressed with the mildest ointment, and were all healed up in seven weeks. In a fortnight more, the exostoses also were perceived to diminish; and, from this time, she had a gentle perspiration all over the body, by which she appeared to be greatly relieved. The mercury was continued, and the opium increased to four grains thrice in the twenty-four hours, or twelve grains a day. In three months from the first exhibition of the mercury, the exostoses entirely disappeared; but, for fear of a relapse, I continued the mercury for three weeks longer, after which I did not hesitate to pronounce her perfectly cured; and the event justified my expectation; for she has now kept her health without the smallest complaint for upwards of four years. Her skin, which was rough and dry before she began to take the medicine, became quite soft and smooth, almost like that of a child, and her appetite, which had been gone, returned with great keenness.

In this case, though there was a swelling on one of the legs which appeared to contain matter, I did not think proper to open it, nor to use any external application, being determined to leave it to nature; and fully persuaded that the admission of air to any ulcer, wherever situated, must be attended with bad consequences. My

opinion, then, decidedly is, that in cases of venereal exostosis, we ought neither to use any external applications to them, nor make any incisions either by caustic or otherwise; as the cure is only to be accomplished by mercury, and of consequence the use of caustic or incision can be attended with no good effect. We must therefore patiently wait its effects on the constitution, and we will soon perceive its great power in dissolving those concretions or obstructions which the venereal virus seems so peculiarly calculated to produce. For the first five or six weeks the medicine should be used as a strong alterative, but not in such quantities as to act decisively. If the patient bears it well, and the symptoms begin to abate, the mercury should be gradually augmented, and persevered in for six weeks more; and the medicine will be much assisted by the use of the warm bath twice a-week. Here, however, the opium appeared to act as a strong diaphoretic. The patient must be kept within doors during the whole of the cure, and the mercury persisted in for at least three weeks after every venereal symptom has disappeared. The pain is to be alleviated by opiates, and he may be allowed to drink freely of the decoction of *sarsæ* during the cure.

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## SECTION XIII.

## OF CORNS.

THESE are small round and hard tubercles arising on the toes, commonly from the pressure of ill made shoes, and frequently attended with very considerable pain. But, though the toes are generally the seats of those tumors, they are not peculiar to them alone ; for corns will likewise arise on the soles of the feet, the edges of the heels, and even on the palms of the hands in people that work hard, where the skin is very thick ; and in these they appear almost at the roots of each finger, in the inside, where the pressure is greatest ; whence it is evident that by pressure alone these tumors are occasioned. In general they go no farther than the skin, and are inserted into an hollow place or cup, which resembles a kind of pedestal ; and this sometimes goes deeper than the skin, and appears to arise from some of the tendons or aponeuroses of the muscles. The immediate cause of them is evidently a contraction of the vessels of a certain spot by pressure, in consequence of which they are so much obstructed that the fluids cannot circulate through

through them; the skin generally remaining dry, shrivelled, and hard above them. Thus a crust is formed over the corn, which must be well soaked in warm water, and then scraped off with the edge of a knife, before we can see the tumor itself. By a little pain we may now turn out the corn with the point of a scalpel, and will find it to be a round, firm, hard, and horny like substance, inserted, as we have said, into an hollow or cup in the upper part of what I call the pedestal. By the mere turning out of the corn, however, the disease will not be cured; the pedestal itself must also be removed, and then its return will be as effectually prevented as that of a wart after it has been taken away by any of the methods already described. When we attempt, however, to remove this pedestal or cup, or even when it is strongly pressed, the pain is often so exquisite as might surprise us, considering the smallness of the spot affected. We must therefore gently insinuate the point of the knife between the cup of the corn and adjacent skin all round, in order gently to separate them; after which, having laid hold of it with a pair of dissecting forceps, we must pull it gently towards us until it comes entirely away, when it will sometimes be found of such a length as to have reached even to the periosteum. These substances, at least all of them that I have examined, are as perfectly inorganic as any  
piece

piece of horn; the pain and blood being occasioned by the connection of the root with the arteries and nerves of the cutis vera; and, if proper care be taken, we always may remove the corn without the least pain or drop of blood; but it is not so with the root, which penetrates the skin, and being attached to it, must always occasion an effusion of blood when it is separated and pulled away from it; and if it goes down the length of the periosteum, must likewise occasion pain there by irritating that membrane. The small wound, however, made by the extraction of this substance, will always be easily healed; and it is evident that the more effectually this removal is accomplished, the greater security we have that the corn will not return.

After having removed as completely as we can both corn and pedestel, the patient is to put on a pair of large stockings and shoes, bathing the feet once every night in warm water, scraping off any small parts of indurated skin that may be observed, and removing any bits of the root of the corn that have made their appearance. Every time we do this, we must likewise apply a little basilicon ointment, made with a double proportion of resin, through the night, keeping it on with the finger of an old glove cut in such a manner as to fit the toe, and tying it round the ankle to prevent its slipping off. Thus the  
corn

corn will be totally removed in three weeks at most ; and, to prevent any return, it will be proper to wash the feet in warm milk and water every ten days, by which a constant and gentle perspiration will be kept up through the whole foot ; the heat and chafed skin will be removed, and all tendency to induration kept off. Along with this, however, it must be observed that the patient must always wear large shoes, and not suffer his feet, on any account whatever, to be pressed into such as are too narrow ; for, if this be done, it will be impossible to prevent the return of a disorder which otherwise would never trouble the patient more during life.

#### SECTION XIV.

##### *OF THE HYDROCEPHALUS INTERNUS, AND SPINA BISIDA.*

**BOTH** of these are diseases of the dropical kind, the former being a collection of water in the inside of the cranium, the latter in the theca spinalis, sometimes seated on one of the sutures of the skull, or between the vertebræ of the neck, back, and loins. Neither of these disorders are properly the objects of surgery, as there  
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is no instance of a cure being performed on any patient by means of a surgical operation. In some instances, though very rare, the hydrocephalus has been cured by the use of mercury; and in one or two instances the water has been let out in small quantities at a time, by puncturing the skin with a lancet, not only without destroying the patient, but with evident relief. In by far the greatest number of cases, however, the patient has died in spite of every thing that could be done; and in this respect the spina bifida is even worse than the hydrocephalus, for there is not a single instance of any patient having recovered from this disorder even when left to nature; and, when the water was evacuated by puncture, death has ensued much sooner than otherwise it would have done. The spina bifida may be known by a soft tumor of the colour of the skin situated on the vertebræ, part of the substance of which is always wanting. The parts below the tumor are generally paralytic, as in the curvature of the spine already treated of.

## SECTION XV.

*OF THE BRONCHOCELE.*

THIS is a tumor of the fore part of the neck, between the skin and windpipe, supposed to be owing to a dropsy of the thyroid gland, which  
is

is situated just below the larynx, round the trachea. The true bronchocele is very rare in this country, and I have not indeed seen one instance of it. A modern writer in surgery has confounded it with an aneurism of the carotid artery, with melicerous and steatomatous tumors, with an hernia of the trachea, forced out by coughing, &c. &c. ; but, from the account given of it by Dr Proffer, who has written a treatise upon the subject, it appears to be entirely a dropical affection of the gland ; and this is confirmed by the account he gives of a dissection of a diseased gland of this kind by Dr Hunter, who found it to contain a great number of capsules filled with water. To this treatise, therefore, I must refer the reader, having nothing to say from my own experience concerning it.

## SECTION XVI.

### *OF SCROPHULOUS TUMORS.*

THESE have been so fully treated of under the head of scrophula, that the treatment of all of them must from thence be readily understood ; to that chapter therefore I must refer.

CHAP.



CHAP. XXIII.

*OF DIMINISHING THE PAIN IN CHIRURGICAL OPERATIONS.*

As, in the next volume, we are to treat of the most formidable operations in surgery, where the sufferings of the patient may be supposed to be increased to the utmost, I shall conclude this volume with an account of what may be done to alleviate those sufferings, and to render the operation more tolerable than it would otherwise be.

There are two general ways in which this seems possible ; one is, by diminishing the sensibility of the patient, so that he may not be capable of feeling very acute pain ; the other, by compressing the nerve which goes to the part to be operated upon, so that it cannot feel pain so acutely as it would otherwise do. Opium would perfectly answer the first intention, were not its effects upon the system to be dreaded. Large doses of this medicine are very apt to bring on sickness and vomiting, which, after some operations, are much to be dreaded ; and therefore

therefore its use is laid aside by the most judicious practitioners. A machine for compressing the nerves was invented by Mr James Moore of London, and is represented Pl. 9. Fig. 4. It is designed to compress the nerves so completely, that the parts below it may be altogether insensible, and thus the operation be performed absolutely without pain to the patient. A difficulty, however, occurs here. To produce this perfect insensibility, the nerves must be compressed at least an hour; and, as they always lie near the large veins, there is danger of taking in some of the latter along with them; and such a long continued compression on a vein would be in danger of causing it burst. To remedy this, Mr Moore proposes to open a vein; but, unless in robust patients, this could not be done; so that, until the machine can be brought to such perfection that we can certainly compress the nerves without the veins, we cannot expect from it those advantages which it otherwise promises.











